

technology review

Published by MIT

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Technology Review

Common Room.

THE TECHNOLOGY CLUB.

Dining Room.

The Technology Review

VOL. III.

OCTOBER, 1901

No. 4

A GLIMPSE OF PORTO RICO

About two years ago the name Porto Rico was a powerful magnet to which people were attracted, eager to learn



Entrance to San Juan Harbor.

about the little island, of which they had hardly heard before. The interest, while less active to-day, is, nevertheless, as true and well merited. For Porto Rico is as beau-

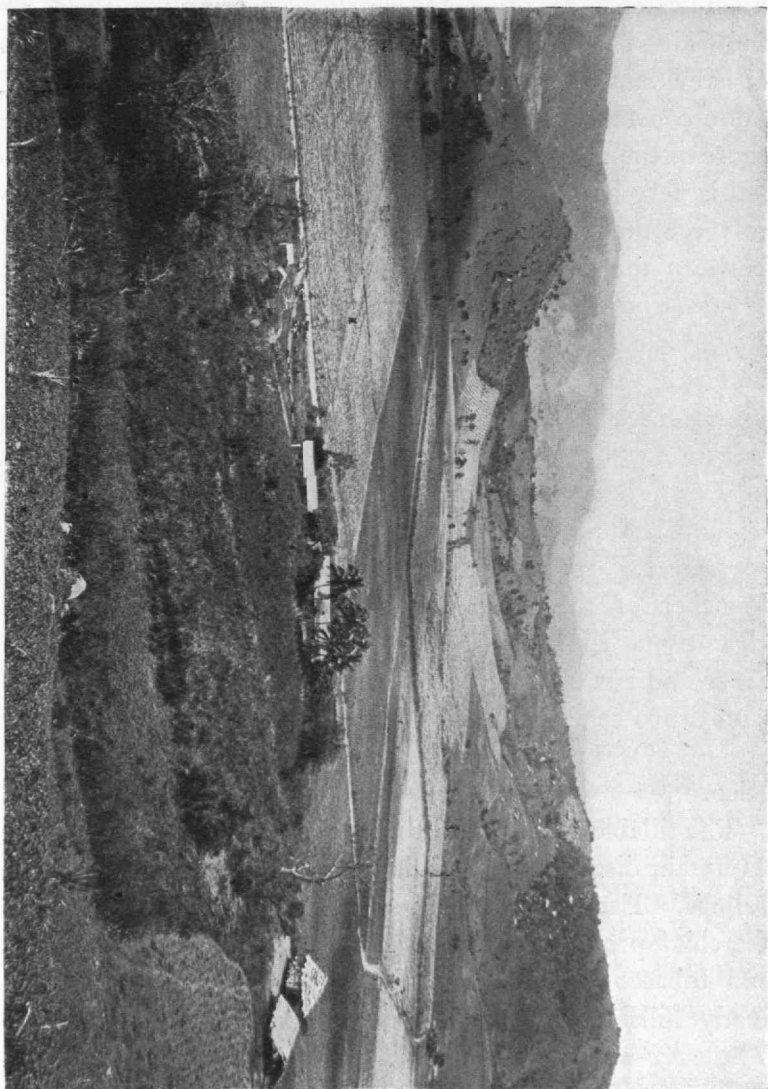
tiful and more attractive than ever, and no American traveler should be satisfied until he has seen this garden island and felt the joys of a Porto Rican tour.

When the island was first discovered, it was called "Borinquen" by the aborigines, a name which is dear even to-day to the native Porto Rican. The discoverers called the island "San Juan Bautista," and founded a town which they named Puerto Rico. To-day custom has settled upon calling the entire island Puerto Rico, and the original town San Juan.

The explorer of Porto Rico and its first governor was Juan Ponce de Leon, well known to Americans as the discoverer of Florida. History relates that, when he landed upon the island, he was well received by the aborigines, who exchanged the usual ceremonies and welcomed him and his party. It was not long, however, before there was a rupture of these amicable relations, which ended very sadly for the poor Indians, as, a few years after the Spanish occupation, there were few, if indeed any, aborigines left.

No record is found of the exact number of this native population, as Juan Ponce and his party were more occupied looking up sources of native gold than in making up census reports. The official records show for 1765 a population of but 39,846 free men and 5,037 slaves. These people, whose export trade in 1765 consisted principally of cattle and native woods to the annual amount of \$117,376, have multiplied to nearly one million souls, whose annual export trade amounts to approximately \$12,000,000.

The island is a fertile land of about 3,500 square miles in extent, possessing a healthful and delightful climate at all seasons of the year. The temperature ranges from fifty to ninety degrees Fahrenheit, and seldom goes beyond these limits.



The Maunabo Valley.

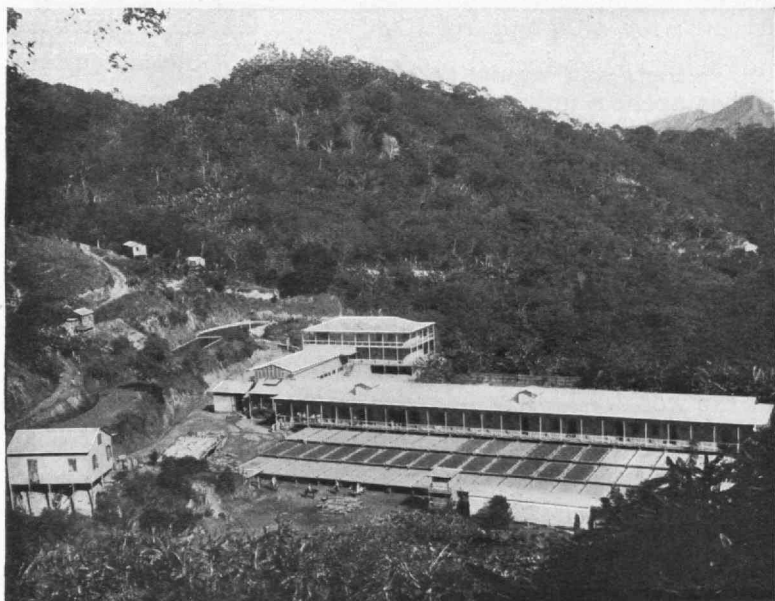
A large range of mountains divides the island into two main watersheds, the northern shed covering two-thirds of the width of the island, the southern the remaining third. It is evident, therefore, that the largest rivers and those of more constant flow are found on the northern shores, while those of the south shore are of less reliable flow. The rainfall is very large, from 90 to 120 inches a year, or from two to three times that of New England, unevenly distributed between the dry season from January to May and the wet season from June to December. Amongst the riches of Porto Rico are to be counted the many rivers that water its fertile valleys and which will furnish in time one of the great sources of wealth to that beautiful island.

The north and south shores are distinct valleys extending, more or less uninterrupted, from one end to the other of the island; while the east and west shores are a series of separate valleys, shut off from one another by the several branches of the main range of mountains which extend abruptly, at times, to the very shores. Nearly surrounding the island is a chain of coral reefs; and, beyond these, the land drops so abruptly that some of the deepest parts of the Atlantic Ocean are found but a few miles away from Porto Rico.

The tillable lands of Porto Rico are of three classes,—the mountain districts, the undulating *sobre-mesas*, and the shore valleys. Each class of land provides a home for certain of the chief products of Porto Rican agriculture. The coffee and tobacco grow best in the interior,—the first on the shady hillsides, the second on the margins of the rivers. The *sobre-mesas* are the ideal pasture lands, and the shore valleys form the best soils for sugar and rice cultivation.

Coffee is the principal product of Porto Rico. It grows luxuriantly in the interior. It is thankful for the shade

provided by other trees, although in high altitudes it will thrive without this protection. The quality of Porto Rico coffee is excelled only by Mocha, and compares favorably with that of Java. In Europe it is very much appreciated; and Germany, Italy, France, and Austria pay higher prices for it than for most other coffees.



A Coffee Plantation.

The hurricane of Aug. 8, 1899, did great harm to the coffee plantations, as it not only destroyed the growing crop, but also uprooted many of the larger and best-bearing trees. Three or four years are required for coffee plants to bear fruit.

Much of the present discord in parts of the island is undoubtedly due to the fact that most of the coffee plantations are heavily mortgaged, that coffee derives no protec-

tion from the present customs tariff, and that Porto Rico coffee is but little known in the American market. Its principal industry is crippled, and the chances of revival are slight. Quick adaptability to new conditions is needed; but, unfortunately, the native population, as a mass, does not possess this requirement.

How serious this situation is remains a question for conjecture; for, although free trade with the United States has not helped the principal product of Porto Rican agriculture, it has opened unbounded possibilities for many other industries. Tobacco, for instance, is destined to be one of the greatest sources of revenue to the island. It is best grown on the bottom lands of the interior valleys, away from salt air. The quality of Porto Rico tobacco makes it excellent for fillers. Much of the tobacco used to be shipped to Cuba and there manufactured into Havana cigars, under which guise it found ready sale in the markets of the world.

Tobacco planters need to grow their tobacco and elaborate their cigars in a way which the American taste demands, and also to spend energy and money in making their brands known and appreciated by American smokers. Many planters and tobacco merchants thought they saw in free trade an opportunity to rush their cigars and tobacco leaves, regardless of quality, to the American market. They paid dearly for their folly, as their leaf remained unsold in New York, and their cheap cigars gave Porto Rico tobacco a poor reputation among smokers.

Naturally, the tobacco industry also experienced a serious check; and hence another rude blow was given to the popularity of the American régime in Porto Rico. The remedy is in the merchants' hands: they have an opportunity such as they never had before, and they are awaking to

it. In this connection it may be said that tobacco farmers in the States need have no apprehension as to Porto Rican tobacco. In a cigar more than one quality of tobacco is needed, and a cigar made with a Porto Rico filler and Connecticut Valley wrapper should keep every smoker in the



A Typical Herd.

Union in perfect contentment of mind as well as make a creditable place for itself in the European market.

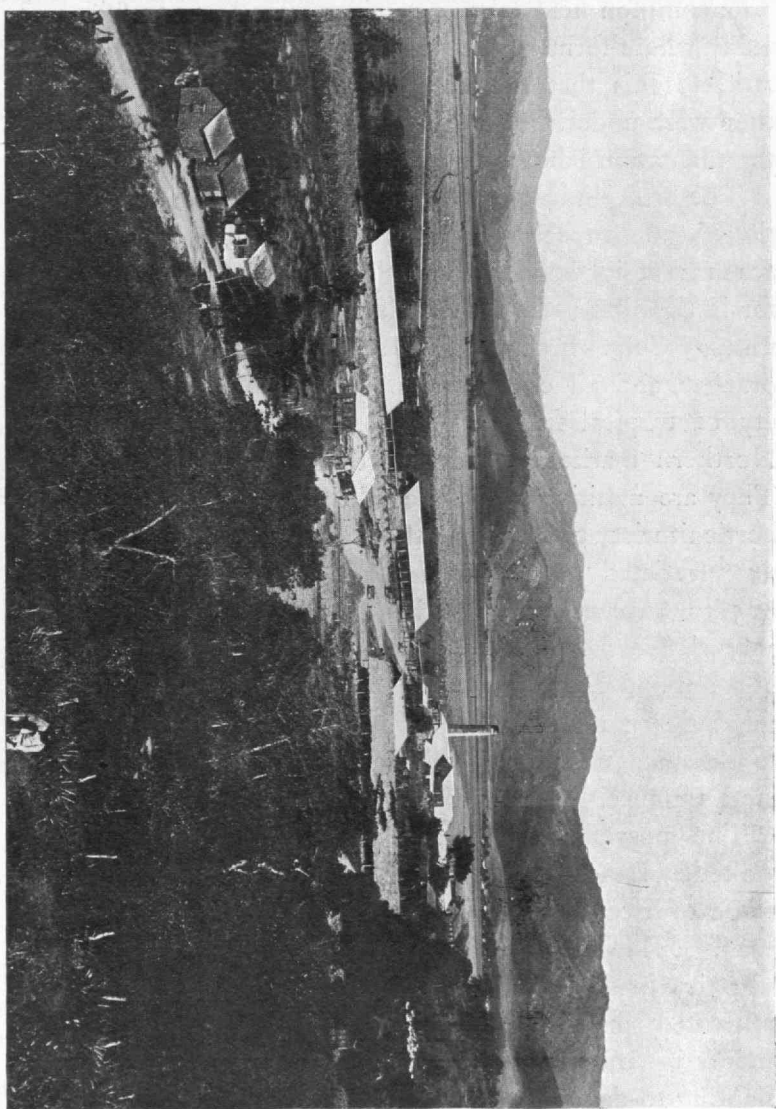
Horses, mules, and cattle thrive wonderfully in Porto Rico. The horses are small, but hardy. The cattle are large, sleek, healthy, and excellent for farm work, though not for the dairy or the market. The principal pasturage is guinea grass, which grows on dry lands, and *mallojilla*, which is found in swampy or wet lands.

Sugar furnishes one of the most promising industries of

Porto Rico, and certainly the most interesting from a technical point of view. Most plantations in Porto Rico are small and out of date; there is a great field for improvement. It is only a question of time when all the old bull-mills and the smaller plants will give way to large and modern central factories. But few people, even those interested in sugar manufacture in Porto Rico, realize the critical period through which the sugar industry of Porto Rico was passing at the time of the American occupation. Of all the sugar-producing countries of the world, only two had gone backward in their output of sugar; and of these Porto Rico was the leader, having fallen off 48 per cent. in its production.

The sugar industry of Porto Rico has taken a new lease of life; and, if the planters are wide-awake, they will reorganize their plantations in such a way as to enable them to compete favorably with any sugar-producing country in the world. A modern sugar plantation should take care of no less than two thousand acres, and from that up to ten thousand acres of planted cane. The director of a modern factory should be a technically trained man, a chemist or an engineer. It is by means of the technical control of sugar-houses that the Germans have been able to make the wonderful progress they have attained in beet-sugar production. The coming five or six years are bound to see great advancement in the development of the sugar industry in Porto Rico; and it is very probable that a large number of central factories will be built, mainly by American engineers and capital.

Of all industries in Porto Rico, sugar was the first to feel the benefit of American occupation of the island. The benefit is not limited to the planters, however, but extends to the laborers, who are getting to-day from 30 to



The 'Bordelaise' Sugar Estate, Maunabo.

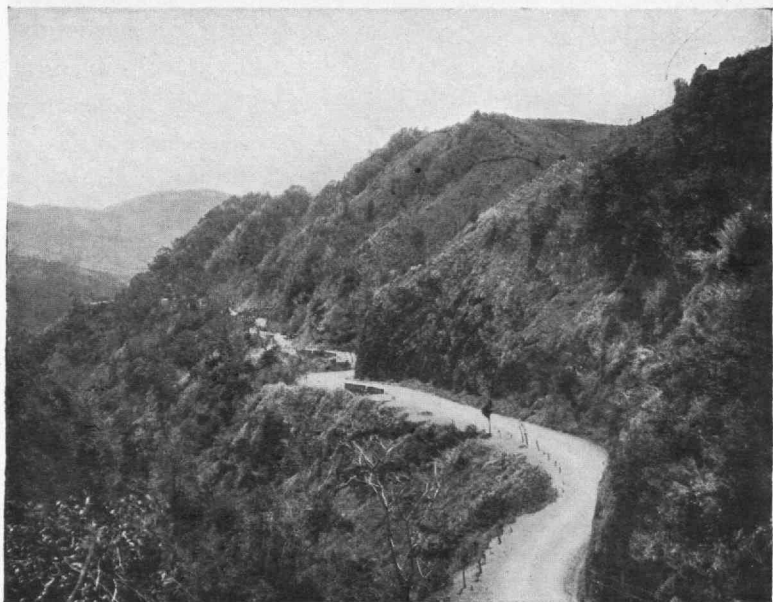
60 per cent. higher wages than they formerly obtained. The common field laborer receives from forty to fifty cents a day where formerly he had the equivalent of thirty cents. Add to this that the necessities of life are cheaper than they were under the Spanish régime, and it is apparent that the plantation laborer certainly has cause to feel grateful.

The fruit industry of Porto Rico deserves to be mentioned, not on account of its present importance, but on account of its wonderful possibilities. It is safe to claim for it the first place among future Porto Rican industries, unless Cuba becomes a part of the Union. Limes, oranges, and all citrous fruits, pineapples and a large variety of tropical fruits, as well as early vegetables for the Northern markets, are dormant elements of future wealth. They are awaiting the hand of the Northern farmer and horticulturist to awaken them. Fruit-lands are to-day unappreciated in Porto Rico, and can be bought at from \$15 to \$20 an acre. It is the one industry where the shrewd Northerner with pluck and ability can find plenty of room and doubtless great rewards. The lands suited to this industry are hillsides and interior valleys now given up to the most indifferent sort of pasturage, which yields a mere pittance.

The possibilities of rice culture should not be overlooked. Lands too wet for sugar will yield abundant crops of rice, a product highly protected by the present tariff. Hillsides also yield very generous crops of mountain rice in Porto Rico. About all the rice at present cultivated in the island is this mountain rice, planted mainly by the poorer classes of natives. Those who are planting to-day will reap large benefits, and others will be sure to follow their example.

The development of the island's agricultural resources

must be followed by many enterprises which are the natural sequence of thrift and good crops. Roads and railways, both steam and electric, irrigation plants and land drainage, water supply and sewerage systems, electric light plants, factories, public buildings, piers, etc., will surely be



The Aibonito Pass.

built in the near future. Indeed, many of these enterprises are now going on; and others are awaiting the necessary capital, which can only come through the development of the island's resources. Then the engineer as well as the farmer may look upon Porto Rico as a prospective field for his energies.

But, while future possibilities for enterprising young men exist in Porto Rico, its mild and delightful climate offers a

perfect winter home to the rich, to the invalid, or to those who desire to escape from the rigor of a Northern winter. Not the climate alone, but the wonderful scenery, the luxuriant tropical vegetation, so new and interesting to the Northerner, the excellent driving, and delightful bathing



A Palm Grove.

make a combination of attractions seldom found in a winter resort.

Blessed by Providence with a rich soil and climate unsurpassed, Porto Rico has at last obtained its greatest requirement,—a market for its product. The island has before it a period of prosperity and progress such as it has never enjoyed before, and such as should be the heritage of a new star of the American Federation.

LOUIS F. VERGES, '91.

THE PROFESSION OF TEACHING

One of the most painful things to the student of education is the wide difference between the high results of public school teaching which he believes to be practicable and the actual achievements of the usual public school. Theoretically, free public education should be the supreme force in every community: practically, it is not. Theoretically, the extension of such education should be followed by a higher political morality and a deeper sense of social responsibility: practically, it is not. Theoretically, the teacher — spiritual or temporal — should be honored above all other men: practically, he is not. Who is to blame? In part, the parent, for neglecting to take active interest in the work and standing of public schools; in part, the community, for giving grudgingly toward education and refusing due support and honor to those who teach; but, most of all, the teachers themselves and the colleges of arts and sciences, for failing to regard teaching as the most important and honorable of all professions.

It is, indeed, the exceptional teacher — outside the faculties of colleges — who seriously looks upon himself as a professional man. The ordinary schoolmaster has little of the personal weight, of the sense of professional responsibility, of what may be called the corporate self-respect of the lawyer, the physician, or the engineer. The traditions of the teaching guild do not yet demand a wide education, a slow and laborious preparation, a careful and humble apprenticeship, such as are required for entrance into the really learned professions. A broad education and the poise of mind which follows it are the vital needs of a great

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majority of the public school teachers of to-day. They are ceaselessly complaining of a condition of things which is indeed grievous, but which is largely of their own creation. They demand high place without qualifying themselves to hold high place; they rebel at a not uncommon attitude of contempt or of contemptuous toleration on the part of the public, but do not purge themselves of the elements which excite that contempt; they accuse the parents and the public of indifference toward their work, but do little to render that work of such quality as to forbid indifference.

There is no reason — except in negligent custom, in which the majority of teachers and practically all of the colleges acquiesce — why the man or woman who has charge of the mental growth of the child should be satisfied with a training less thorough than that of the physician who cares for his body, the lawyer who manages his property, or the clergyman who ministers to his soul. It is idle to claim, as is sometimes done, that there is no profession for the teacher to study, that the art of teaching comes by nature, and that, if there be a sort of science of education, it will filter out from the errors and successes of experience. The body of the law is but a record of human experiments and mistakes in social order. Medicine itself is but the crystallized result — always recrystallizing — of centuries of empiricism, often disastrous, upon the human constitution. Engineering, founded though it be upon a science so exact as mathematics, is the net result of an infinite number of blundering attempts to solve the problems of matter and of motion. But the fact that these professions and the sciences upon which they rest are always undergoing change, that often the accepted truth of to-day is the proved fallacy of to-morrow, does not lessen their dignity, does not discourage their followers from long years of preparation for

them, does not justify the men of those professions in working by rule-of-thumb methods and haphazard guesses when it is possible, through study, experimentation, and mutual enlightenment, to work by known laws, in orderly sequence, toward well-defined ends. There is abundant foundation for a science and art of education as elaborate and dignified as that of medicine ; but the science and art will not develop so long as it is regarded as possible and natural to admit half-taught girls and youths, or those who follow teaching only as a temporary means of livelihood, to full fellowship with thoroughly educated, professional teachers. Neither will this science and this art emerge into professional dignity until the colleges and the professional schools define them, co-ordinate the subjects of study upon which they are based, and place the "Graduate in Education" upon the high plane of the Doctor of Medicine and the Bachelor of Law.

Were there, however, no well-defined science and art of education, abundant reason would still remain why the public school-teacher, quite as much as the college professor, should be soundly and broadly trained in a range of study and thought far beyond the topics that he teaches. For it is the personality of the man, the breadth of his grasp of life, and the atmosphere which he creates and maintains in his school-room that, more than anything else, secure his success in teaching and really develop his pupils. These qualities can be secured, in general, only by a sound and extensive education.

No teacher has a right to lament the blindness of the public toward the value of his work who has not fitted himself in the highest measure really to be an educator. No body of teachers may honestly "resolve" for greater recognition and consideration from others unless they are

themselves doing yeoman work toward raising the standards of preparation and attainment within their own profession. So long as low ideals of school work, routine instruction, and aimless methods—to say nothing of political interference—are tolerated by the teachers themselves, the schools and those who conduct them will fail of due honor and support, will fall far short of their possible efficiency, and will not take their rightful place as the supreme uplifting force of every democratic community.

If it be deemed necessary that the professions of law and medicine should be governed by the strictest rules, should frame elaborate codes of ethics, should have only the highest and purest aims, purging themselves of all shysters, jerry-builders, and quacks, how infinitely more important that this profession of teaching, the work of which is greater, higher, nobler than any of those others, should be regarded, too, as a sacred guild into which no traffickers or triflers be allowed to come, concerning whose work none but him who knows should have anything to say, whose sole aim should be to make of every child of the millions under its care the very most that can be made.

Certain stock arguments are always brought forward against the possibility of such high professional standards. The pitifully poor rewards, the uncertainty of tenure, the often anomalous social position of the teacher,—all these and many similar disadvantages are advanced as reasons why it is not worth while to attempt to raise the present standards of attainment. The hosts of glib pretenders, the arrogance of ignorant school committees, a cheap and noisy commercialism, are, it is said, insurmountable obstacles to the creation of a generally high, fine conception of teaching such as exists among a few devoted, really educated schoolmasters. A man who adopts the work of teaching must

have, we are told, something of the martyr spirit; for this profession has in it an element of self-sacrifice which the other high vocations do not demand. Truly, the work of the teacher does involve much sacrifice of self; but it meets with immediate and tangible reward in the uplifted lives of the children for whom the sacrifice is made. This is a return which even the profession of the clergy rarely sees. Moreover, were the majority of those who teach broadly educated men and women, were there an *esprit de corps* among them such as is found in every other profession, the petty things of teaching, which now so often overshadow the great things, would disappear and the rewards, both material and insubstantial, would be vastly increased. Rights and privileges would then be eagerly offered where now they are clamored for in vain.

The education of the teacher—whether he is to deal with infants or with collegians—should be as nearly as possible like the best training given to the young physician. He should have, in the first place, a general education so thorough and well balanced that he may be able to deal wisely, as the physician is called upon to deal, with those problems of character, those perversions of mind and morals, those subtle diseases of the will which no medicine and no surgeon's knife can reach. Having made himself thus a broad man, a proper counsellor, the young teacher must next, as does the medical student, become familiar with the technical details of his profession, learn what is known of the mental growth and reactive processes of children, study the laws of mental health, the modes of its preservation, the methods of stimulating mind and soul, the effects, good and bad, of association, what one might call, in short, the pathology of childhood and adolescence. More than this, he should make himself, as far as can be

done theoretically, master of the details of the school-room. Next, just as the medical student takes his course in the hospitals, the teacher must secure actual, hard practice in teaching, with pupils of many sorts and conditions. And, finally, throughout his whole professional preparation he must make a careful analytical and philosophical study of the history of education.

What, beyond anatomy and physiology and laboratory work, is the three or four years' course of the medical student except a study, under guidance, of the history of medicine, of the record of human experience concerning the treatment of disease, concerning the preservation of health? When a young worker in the hospitals meets new symptoms, does he guess at the disease which they denote, does he experiment first with one drug and then with another in the hope that he may hit upon something suited to the emergency? Absurd supposition! Yet that is what teachers are doing every day. A new child comes to them whose moral habit and intellectual reaction indicate disease, or lack of normal susceptibility to education. Immediately the average teacher runs through his small record of experience to ascertain if he has had a pupil of such kind before. Finding in his memory a case having somewhat similar features, he at once decides that the disease is due to the same conditions, and must be treated in a similar way. If, after a few weeks' trial, it is evident that the treatment is not successful, he tries another moral and intellectual medicine, or, more probably, gives the case up and subjects the pupil to the general routine discipline and mental diet which have been prescribed, in a rule-of-thumb fashion, for the average, normal boy or girl. As a result, his patient dies,—not, unfortunately, in the flesh, but, what is worse, in the spirit; and one more vic-

tim is added to those slain, with the best intentions, by pedagogical malpractice.

When the physician, on the contrary, meets obscure symptoms, he goes at once to his record of other men's experience, to his authoritative books, his latest medical journals, his older colleagues. With their help he makes diagnosis of the disease and learns the manner of treatment approved by experience and analogy. Or, if the patient is in good health and desires to perpetuate that happy state, the physician, having made careful study of the diet and exercise suited to that man's condition, gives him proper advice. In the manner of the doctor the good teacher should regard every pupil as a patient,—either as a well one to be kept in health and to be helped to grow to his fullest stature; or as a sick one, to be physicked and nursed back, if possible, to mental and moral well-being. Every well-trained teacher ought, as a matter of course, thus to individualize and treat his pupils; his professional instinct should impel him to it; he should find delight, as the physician does, in the mere act of healing, in the power and influence that his skill has given him. Such a school-master, provided he have the teaching enthusiasm,—just as the successful medical man must have the healing fervor,—will never question the wisdom of his choice of a profession; for he will know that he is doing the best and most enduring work which is in the power of any man to do.

A thorough education, then, the breadth that follows it, and a professional consciousness and pride are what the public and private schools must demand in their teachers if those schools are to achieve real educational development. But these essential things the majority of teachers cannot and will not secure until the colleges and universities not only freely, but enthusiastically co-operate with them, until

it is made not simply possible, but absolutely necessary for every teacher to have been well taught. In failing to recognize their responsibility in this matter, the higher institutions have done the community and themselves uncounted injury: first, by fostering the all too prevalent notion that anybody can teach, thereby impairing the dignity and standing of their own faculties; secondly, by leaving the preparatory training of their college students practically in the hands of amateurs, thereby vastly diminishing the intellectual and moral efficiency of those young men and women; and, thirdly, by permitting many boys and girls eminently fitted for collegiate work to be turned aside from all thought of going to college by the dulness and unintelligence of elementary teachers, one of whose chief duties should have been to discover and to encourage those youth who are worth a higher education. On grounds of pure utility, therefore, to say nothing of their moral obligations as leaders of thought and promoters of social good, the colleges ought to make it their chief business to prepare men and women for this work of teaching, — this work which lies at the fountain-head of their own usefulness as well as of the welfare of society.

Twenty-five years ago it would have been impossible for a college, even had its faculty perceived the need, to offer a distinctive course for teachers and to rank the graduates of such a course with those in medicine and law. The public, the school managers, the teachers themselves, with rare exceptions, would have been cold, if not indeed scornful, toward such an exaltation of the schoolmaster. To-day, however, conditions are vastly changed, and increasing numbers of thoughtful men and women perceive that in this direction lies at least a partial solution of the vexed questions of public education. That "psychological moment," which

institutions as well as governments must await, has arrived. What would have seemed preposterous a quarter of a century ago is to-day not only natural, but inevitable; and those colleges which hesitate to meet this demand of the times will fail of a duty and an opportunity.

Fortunately, the step is not a difficult one. Whether it be a college of arts or one of sciences, the resources are already at hand with which to initiate the real professional training of teachers and from which to build up step by step (as training for all the professions has been tentatively evolved) the established and recognized qualifications of the expert teacher. The colleges of arts have, and the colleges of science should have, their philosophical and historical faculties so organized that the special training of the teacher in those directions can be easily begun and fully, though of course slowly, developed. All college teaching should in these days be so firmly based upon the laboratory principle that the establishment of new research laboratories of psychology and new practice laboratories of methods ought to be a matter of no great difficulty. And, aside from these purely technical facilities, the teacher, were he recognized — as too often he is not — as a serious person striving really to fit himself for a lifelong profession, should have no difficulty in gaining from any good college, whether he pursue the older courses of the classics or the newer researches of the sciences, that breadth, poise, and sanity of mind without which an educator, though he be skilled in all the devices of pedagogics and intricacies of methods, is not fit to have charge of any boy or girl.

Every year shows increasing dissatisfaction with the results of the public schools, not because those schools are deteriorating,—on the contrary, they are almost everywhere improving,—but because every year there is more general

appreciation of the fact that genuine public education implies something more and better than a mere routine of lessons. To this discontent are due that restless experimenting upon the schools, that loud demand for reforms in school government and for changes in school methods, and that ceaseless arguing over "content," "correlation," and a hundred other shibboleths of teaching, which seem sometimes to have converted the common schools into mere battle-grounds for theorists.

None of these earnestly striven for reforms, however, will be permanent in its effects until it is recognized by the public, by the normal schools, by the colleges, and by the teachers themselves, that education, especially in the case of children, is almost wholly a question of personal relations; that it is the teachers, much more than their methods, which make or mar the school. The most perfect organization and most ideal curriculum, in the hands of ignorant, narrow, or indifferent instructors, will become not far from valueless. The most meagre resources, on the contrary, will perform a wonderful work of education if wielded by broad-minded, well-taught men and women who have the teaching zeal.

A well-trained teacher ought, of course, to be familiar with pedagogic methods; but he should be their master, not their slave. Details of organization, method, discipline, curriculum, should be to him simply a means of education, not an end. Yet these things—method, organization, curriculum—loom largest in the training of the average teacher; and by his skill in handling these tools of teaching, not by his power as a moulder of men, the schoolmaster is too often judged. It is quite generally agreed that the chief function of the college and the university is to give men larger views of life, greater command of themselves,

higher motives of conduct. None needs this wider outlook, this self-command, this ethical motive, more than he who is to develop the minds and characters of children. To neglect, therefore, to reach in the fullest possible degree this great body of teachers is for the college to lose its finest opportunity.

Because the teacher needs and the college can give breadth, outlook, the fundamentals of larger life and activity, those higher institutions should not, in laying out their courses for the professional training of the teacher, address themselves too minutely to questions of method and details of curriculum. They will be at fault, too, if, because of their new interest in elementary and secondary education, they attempt to look too closely into the workings of public school teaching and to influence too directly the development of methods and curricula therein. Those are questions to be solved by school-teachers, not by college professors. And the heaviest and most harmful pressure which the college can put upon those who are working out those problems is practically to dictate what shall be taught in the preparatory schools by prescribing fixed requirements for entrance. One of the best results of a fuller awakening of the colleges to their duty in the matter of training teachers will be a simultaneous arousing of them to the fact that they should not ask, from the secondary schools, candidates drilled and redrilled in a certain list of studies, but that they should demand young men and women widely, variously, it may be diversely instructed, yet with their individuality developed, with their wills trained, with their minds broadened, and with their characters established.

To secure such candidates for admission to their courses, the colleges must educate those who are to teach those candidates. What waste of time in college work, what loss of

effectiveness, what stunting of results, come from the needless immaturity, the feeble will power, the dulness due to ill preparation of a large proportion of the young men who enter, only those who have to do with colleges can conceive or measure. The remedy, however, lies almost wholly with the colleges themselves. It is for them actively and immediately to concern themselves with the character and the education of the men and the women who train those college Freshmen; it is for them to begin at the beginning by training those who, in the elementary and secondary schools, lay the foundations for the educational work that the college has to do, and who, far more than this, establish the principal foundations of the social and political state.

To effect this, the colleges, whether of arts or of sciences, ought first to establish a recognized profession of teaching upon the same high and exacting plane as that of the other learned professions; second, to offer every wise inducement for intending teachers to pursue to the end these professional courses; third, to give honor and preference to those who have so recognized the dignity of teaching as really to fit themselves to be teachers. And, finally, those colleges should modify the conditions of admission to their Freshman classes so that it may be easy for one, otherwise well qualified, to come in though he have not stuffed himself with past examination papers; but so that it may not be easy for any youth to enter unless he has been truly educated by professional teachers,—by teachers, that is, who have known how to train his mind and body, how to broaden his views, how to strengthen and dignify his character.

EDITORIALS

The following from an editorial in the *Army and Navy Journal*, referring to the assassination of the President, seems worth repeating. It has the right ring, and may well be taken to heart:—

All felt that a murderous assault upon our Chief Magistrate was a blow struck at the heart of every loyal citizen of the United States ; for in him centre the forces that bind us together, and make us a great, because a united, people. Whatever concerns the dignity of the President and the inviolability of his person concerns the self-respect of each one of us. Chosen through the methods of selection we have approved and by the forms of law we have ourselves prescribed, he represents to us the majesty of Law, which is the only sovereign ruling in this country by divine right. When once the seal of office is set upon him, he ceases to be the representative of a party, and as the President of the whole United States justly demands the loyalty and the respect of every citizen. . . . All over the country in various ways the people are, without regard to party affiliations, espousing the cause of the President. . . . But why should we wait until the President lies at the point of death from the assassin's blow before we accord to him this universal recognition of the fact that he is our President, and that what concerns him concerns us all ? Why should we not at all times, and under all circumstances, identify ourselves with his dignity and his security ? . . . Is not the present need of this country an increase of respect for men holding public office, because they represent the law and are the visible embodiment of the power and majesty of the Commonwealth ?

As a people, however, we need have no enduring fear of anarchy or anarchists. It is not conceivable that anarchy can ever flourish in this country to the extent of forming a political factor to be reckoned with. Neither is it reasonable to expect that anarchists should, except temporarily, stand as a menace to the lives of those high in public service. Our government officials are members of no privileged class and are favored by no special laws. Therefore, the anarchists' hatred can have no foundation except in hostility toward all law and authority ; and such doctrines can never take serious root in the United States. Moreover, curiously enough, the

assault at once produces an effect directly opposite to that desired. Not for years, if ever, has the whole body of citizens been stimulated to give such solid support to the government at Washington as by this act. The expression of loyalty is non-partisan and non-sectional, not less pronounced among adopted citizens than with those native to the country. Therefore, there can be little temptation, even for an anarchist, to strike a blow, the only public effect of which must always be to strengthen that law and authority which he desires to destroy.

While it does not follow that no legislative measures are necessary to remedy defects in our laws, which this crime discovers, there is need of much wisdom to avoid ill-advised and hasty action. More stringent penalties for assault upon the Chief Magistrate of State or Nation would seem advisable, not in the hope that greater severity of punishment would deter a fanatic such as Czolgosz, but because inadequacy of legal punishment furnishes an excuse for popular passion to suggest, or even to practise, lynching. And every such suggestion leads to greater disrespect for law and authority, reverence for which such terrible events as this ought rather to deepen and intensify. It is probably true, as is sometimes suggested, that a diminished respect for authority, a tendency to encourage undue freedom from restraint, and a less appreciation of the value of discipline are characteristic of the times. Greater regard for the rights of the young is apt to lead, in the home, to less regard for what is due from children in the way of respect toward their elders and of obedience toward their parents. The effort of the teacher to interest and instruct the pupil leads frequently to cultivating the line of least resistance, even to the omission of those tasks the successful accomplishment of which develops the mental fibre and the character necessary to good scholarship. The election of studies, now so common in many colleges, yields ample opportunity for many students to tread easy paths, and to avoid that discipline of severe study which is the most valuable feature of a young man's education. That our Institute avoids material error in this direc-

tion is a matter of common knowledge. The necessity for earnest, faithful work, for care and precision, whether in calculation or in manipulation, which the inevitableness of natural law compels and which the student of applied science must early recognize, is disciplinary in a high degree, and tends to build character as well as to develop brain.

On another page a contributor makes a plea for a broader view of the profession of teaching and for better recognition of the work of the teacher. It is a matter in which public opinion must be developed and educated. From the teachers themselves and from the colleges and schools of science must come the first impetus and the sustained interest and enthusiasm which must mould public opinion, and gradually bring about a better state of affairs.

To-day one of the chief obstacles to the broader and more careful education of the prospective teacher lies in the comparatively short period of activity and the uncertainty in tenure of office to which the teacher is limited. Whether this be due to outside causes, political or otherwise, or to causes within, such as loss of enthusiasm and interest on the part of the teacher himself, it seems to be a fact that, unlike the doctor, whose recognized value grows with advancing years, and who may look forward to increasing emoluments to the end of his life or activity, most school-teachers have to face the probability of being retired from the most active service and the highest financial recognition long before the period of old age. When the comparatively small compensation during service and the difficulty of forming new ties are considered, the importance of this influence can scarcely be doubted.

A remedy for this disability suggests itself in a more intimate relation of the State to the public school system or the adoption of the pension system. This is not a new idea, but is already under trial in several of our American cities.

The difficulty of divorcing the school system from politics has also been touched upon by the writer, but the equally pernicious influence of religious intolerance has not been raised. Bostonians

who have followed the recent struggles of the Public School Association and other similar organizations to obtain unbiased and efficient supervision of the school system well know how strong this influence may be.

An interesting account of the preliminary steps taken by the trustees of the Carnegie Institute and the Carnegie Library in preparing a scheme for the technical school which Mr. Carnegie proposes to endow in Pittsburg has recently been published by the *Engineering Record*.*

It appears that the trustees invited Dr. Thurston of Cornell University, Professor Johnson of the University of Wisconsin, Professor Gray of the Rose Polytechnic Institute, and Professor Alderson of Armour Institute to submit individual reports embodying their ideas upon the subject, and subsequently to submit a joint recommendation, after due conference with one another. "The plan outlined is comprehensive enough in respect to technical science and art to satisfy even the famous words of the founder of a great university: 'I would found an institution where any person can find instruction in any study.'"

Three distinct divisions of the school are proposed,—the day and evening classes for artisans, the technical high school, and the technical college.

The first branch comprises day and evening classes in elementary mechanics, mathematics, physics and chemistry, free-hand and mechanical drawing, modern languages, and elementary instruction in such technical subjects as are taught in the technical high school, supplemented by courses of lectures on subjects of interest to artisan classes.

The second department of the proposed institution is a technical high school, which will draw its pupils from the grammar schools and from the above-mentioned classes. The courses are

* July 27, 1901, pp. 73, 74.

to be largely elective. "In this school the boy who wishes to fit himself for industrial pursuits would find equal advantages with the boy who desired to prepare himself for professional engineering or the girl who wished a general high school education supplemented by instruction in the home-making arts." Shops and experimental laboratories are proposed on a scale greater than anywhere now afforded in the country for the purpose, and the courses would be as follows: 1. The ordinary English high-school studies; 2. Physics, chemistry, and biology, with students' laboratory practice; 3. The elements of the calculus and applied mechanics; 4. French, German, and Spanish; 5. Commercial studies; 6. Domestic arts and sciences; 7. Free-hand and mechanical drawing; 8. Technical studies fitting for the industries of the locality, such as blast-furnace and foundry practice, glass-making, brass founding and finishing, pattern-making and joinery, metal working, engine and boiler management, power-station management, gas-making, railway transportation, plumbing and domestic sanitation, surveying, clay working and ceramics, industrial art.

The third and final step in the education outlined is the technical college, which is to prepare the high-school graduates for commercial and industrial pursuits. "This college should be made attractive to the greatest scholars in the fields of physical and chemical science. To obtain and hold such men, they must be given ample opportunities for research. This college must be supplied, therefore, not only with great experimental shops and laboratories for students' use, but in all departments there should be splendidly equipped laboratories of investigation and research, under the direction of the head of such department, and with a full corps of assistants for the carrying on of lines of investigation which are now partly or wholly unprovided for in America. These well-equipped workshops and these experimental and research laboratories would form the chief distinction of this technical college, and they would also be the chief item of expense. The college would support one or two publications in which the fruits of this research department would be given freely to the world."

The editor of the *Record* criticises the latter plan — for the establishment of a technical college — as being injudicious, since it involves not only the duplication of many plants already in existence, such as those of the Massachusetts Institute of Technology, Cornell, Rensselaer, etc., but also the establishment of research laboratories at large expense for the benefit of comparatively few scholars.

In answer to the first of these objections, it may well be said that the establishment of such a technical school in Pittsburg, the centre of the iron industry, would make advanced technical training possible to many men whose lack of means prevents their going to any of the established colleges. The location is a promising one in view of the distance from Pittsburg to the surrounding institutions, — the Case School at Cleveland, Ohio; Rose in Indiana; Cornell, Rensselaer, and Columbia in New York; the State College, Lehigh, Lafayette, and the University of Pennsylvania in Pennsylvania.

Moreover, the influence of a thoroughly well-equipped, liberally endowed, modern technical school at the very centre of the trades which would be most influenced and benefited by such an institution should certainly not be less noteworthy than has been that of the Massachusetts Institute of Technology in Massachusetts.

As regards the research laboratories, it must be urged that many important and practical problems, particularly those relating to metallurgy, can best be undertaken, and in many cases can only be undertaken, by some such thoroughly equipped laboratory as the one proposed, which counts in its equipment a very large and complete library. Commercially, such laboratories are not paying investments; yet in them, as in some of the German laboratories, has been done some of the most valuable work,— work which began as an investigation or as research work, and which has since been carried further and further, with wider and wider practical application.

The Institute Expedition to view the eclipse of last May at Sumatra brought back much spoils, in scientific results, in photo-

graphs, and in recollections of strange and agreeable adventure. All this the REVIEW had hoped to lay before the readers of its current number in an article from Professor Burton, director of the expedition. But the slowness of the vessel bringing the pictures and the many and more pressing duties of the author made so early a publication of his report impossible. It will appear, therefore, in the January issue, the first of Volume Four.

Not so far away as Sumatra, but quite as unknown to most of us Americans, is our new possession, Porto Rico. That it is beautiful, fertile, and rich in possibilities to the young man of the North who can withstand the languor of a tropical climate, we know; but, as to the nature of the riches and the opportunities, most of us find ourselves extremely vague in our ideas. Fortunate, therefore, are we in having the geographical character and the commercial status of this lovely island shown so clearly, both in words and in pictures, by Mr. Verges, of the class of '91. He writes with the sure and abundant knowledge of one who is a native of the island and who for a number of years has controlled and directed large enterprises there.

The new house of the Technology Club is, of course, an assured fact and equally an assured success. It is only a partially open secret that the controlling reason for a change of location was the necessity for securing a permanent home near the Institute, where the term of occupation could be beyond the caprice of any landlord. There were other points of vantage, however, one of them being a decided decrease in the cost of rental. Beyond this, it was hoped the change would yield opportunity for improvement over the former house, although that had proved very acceptable.

It is easy to enumerate definitely special points of change and improvement in the new house. The real difference, however, is

felt rather than described. Whether in dining-room or common room one is conscious of the change. It is all finer, nicer; and every one feels charmed at once, and generally says so promptly. The crowning glory, of course, must be on the top floor; and truly the new billiard-room is a gem, to many the most attractive part of the house. If a quiet word to the wise be permitted, be it said, as to its practical usefulness, that the new table (for billiards only) is most excellent in quality, its cushions receiving the unqualified indorsement of those most expert among the club's habitués. An additional advantage, sure to be appreciated, lies in the fact that two tables—one pool, one billiard—give some assurance that the would-be player will not find the room completely pre-empted by members of the Faculty, as had been known to happen in the past.

The common room, especially, seems more spacious and harmonious in detail. The general color scheme, even to the selection and hanging of the pictures, is most pleasing. Among the most effective paintings are found a number by our Institute people,—C. H. Woodbury, Ross Turner, and C. L. Adams. Those who have not kept tabs on Mr. Adams for a year or two past will surely feel surprise at the progress he has made, while his better-posted friends are ready to express satisfaction (and not astonishment) at the excellence of his work. The building and refurnishings are, of course, themselves a work of (architectural) art, for which great credit is due to the club members, W. H. Kilham and H. W. Gardner, by whom the plans were drawn and under whose immediate charge, as architects, the changes and improvements were made.

Ground has been broken for the new Technology Chambers described in our last issue, and pile-driving for the foundation is already well under way. The contract was awarded to the George A. Fuller Company of New York, and contemplates the completion of the building July 15, 1902.

REPRINTS — III.

In continuation of its series of Reprints from early documents, the REVIEW presents what is believed to be the first printed announcement, of any length, relative to the Massachusetts Institute of Technology, under its first designation: that of a "Conservatory of Art, Science, and Historical Relics." It is interesting, in the light of later years, to note the wide divergence of opinion as to the means of reaching what appears to have been, at that meeting, a common end; and while it to-day seems absurd to have suggested, as did one of those present, that the "Conservatory" be established in the Hancock house, one cannot but deeply regret that Mr. Ross, in urging the projectors to secure "at least four blocks, of 600 × 250 feet each," was too far in advance of the time to be seriously heeded.

To those who last winter listened to arguments for a Charles River Basin, based, as they largely were, on the example of Hamburg, it is of peculiar interest to find the same model brought forward for Boston's imitation forty-two years ago. So long does it take for an idea of this nature to take root and to develop into action!

It is clear that, like "Zelotes Hosmer, Esq.," all the speakers at this historic meeting "saw in this movement a gigantic plan"; but it needed the master mind of William Barton Rogers so to organize and unify this plan that it might be carried by him and his noble colleagues and successors to its present gigantic and perennial fruition.

CONSERVATORY OF ART AND SCIENCE

A meeting of gentlemen representing the association of Agriculture, Art, and Science, and various industrial, educational, and moral interests of the city, was held at 3½ P.M. on February 18, 1859, at the library of the Boston

Society of Natural History. The meeting was organized by the choice of Hon. Marshall P. Wilder as Chairman, and Dr. S. Kneeland, Jr., as Secretary.

The Chairman stated that the object of the meeting was to take steps for memorializing the present legislature for a grant of land belonging to the Commonwealth, in aid of a plan for a conservatory of art and science; and he invited the representatives of the different interests to state their views. A reading of a portion of the Governor's message, in which he refers to the value of the public land, and advises a certain disposition to be made of a portion of it, brought the subject fairly before the meeting.

Hon. A. H. Rice gave a sketch of the rise and progress of education in this community, and traced the connection between education and science and the mechanical and fine arts. The highest development of knowledge among us was only an expansion of the common-school system. He considered that some such plan as the one presented, for the enlargement and practical application of science in its various branches to the useful and ornamental arts of life, was imperatively demanded as an educational measure. Boston must have it. He considered it not a question of fact, but merely a question of time. He considered the present a favorable opportunity to make application to the legislature in aid of a plan which would be of great advantage to the State as an educational point of view, and which would add to the value of the public land. He thought the mercantile interest was specially concerned in the objects contemplated in this plan, which could not fail to make Boston doubly attractive to strangers.

Professor Agassiz spoke in favor of the plan, which he thought of great importance, as occupying the middle ground between abstract science and its practical applica-

tion. Science, in the abstract, must go alone, not hampered with any considerations of practical application, assisting, but not interfering with each other. The moment they are combined in the same association, science must languish. Hence the importance of some institution occupying the ground of an interpreter between the two, which, he thought, the plan proposed would do.

Mr. M. D. Ross said that the cause of the present movement was the fact that this unoccupied Back Bay land was in the vicinity of the city; in order to make valuable what now is mere water, must be developed by the citizens, must be used for some purposes of public improvement. From conference with persons owning land in the neighborhood, he thought that they would generally co-operate in the carrying out of a plan of the kind, for uniting the various associations of art and science.

His own pursuits led him more especially to favor the section which would form a kind of polytechnic institute. The utility of this could not be questioned, and its probable success he thought merely a question of time. Gentlemen interested in agriculture and natural science, and the citizens generally, would heartily approve it. He thought the main thing at the present time was to secure ample territory, a like opportunity to obtain which would never occur again. Its value must depend on the use made of it; and he knew of nothing which could so enhance the value as the reservation of space for the educational, scientific, artistic, and other practically useful purposes embraced in this plan.

Professor Agassiz, in relation to the Polytechnic School, said that such an institution, intermediate between trade and science, was vitally important, they could not be combined in the same association. This he likened to the high

schools, which are the necessary medium between the primary school and the university.

Rev. Dr. Blagden expressed his approval of any plan which promises to develop the relations between science and art. Such an institution as the one proposed, he thought, would elevate the intellectual standard of the community, and meet a great public want.

Dr. A. A. Gould alluded to the frequency of such institutions in Europe, and thought they were imperatively demanded here. He mentioned particularly the Museum of Practical Geology and the Kew Gardens, the one presenting the wonders of the mineral and the other of the vegetable world to public observation. Such are not only attractive to strangers, but exceedingly useful to every citizen. He mentioned the project of a munificent gentleman of St. Louis, who intended to make for that city a miniature "Garden of Plants," solely at his own expense. What we want to meet this popular demand, in the first place, is ample space; and he thought the present favorable opportunity should be improved to ask for the requisite grant, and that the memorial should be properly presented at once.

J. D. Philbrick, Esq., president of the American Institute of Instruction, spoke in favor of such a plan as an educational agent. He thought a collection of objects illustrating education, from the primary school to the university, a most desirable thing. Such a one had been commenced in Toronto, Can. There is no Polytechnic Institution in America worthy of the name; and he hoped Boston would take the lead in this, as she had in the primary and high schools. Dr. Barnard, chancellor of the University of Wisconsin at Madison, has formed a grand plan of such a school, the only one that he knows of. He

thought the department of drawing and designing patterns, almost entirely neglected here, was of great interest to the manufacturers of the country.

George B. F. Edmands believed such an institution would meet the wants of the fine arts, and that all interested in these (and he would answer for those specially interested in music) would give their hearty co-operation toward carrying it out. As to the space, he thought it should be large, and be rendered attractive as well as useful. In order to secure this, a memorial should be speedily presented. He said it would be a pity that this large space should be compactly built over. His idea was first to secure the area, and let the institution come afterward, which it certainly would. Many interests, and, indeed, the public interest demand it.

Mr. George Snelling spoke of the importance of having a large part of the Back Bay land an open space. If covered with buildings, it would be worse, far worse, than the open water. The south-west wind, the prevailing one in summer, comes over this water, bringing freshness and invigoration to the air of the city. Cover this over with buildings, it would be a most cruel deprivation to the residents of the city in summer. He had conversed with the owners in the neighborhood, and he thought that an ample open space from the garden to the end of the land could be secured by negotiation with those who had already become owners. The late Hon. Alexander Everett thought Boston a most excellent watering-place in the summer, sure always of refreshing breezes on the Common from the Back Bay water. Shut this up with houses, and the Common would no longer be the cool summer retreat that it now is. He thought a large water area should be preserved in the centre, for the health and

comfort of the citizens. He instanced the beautiful city of Hamburg, of whose water area, built around with houses, no one could speak in terms of sufficient admiration. We have all the materials for just such a space here, if we only use them. He could never sanction any close plan. Not only the air, but the glorious prospect of the setting sun would be shut off, which he deprecated, not only for sanitary, but for moral reasons.

Zelotes Hosmer, Esq., saw in this movement a gigantic plan, which, if executed, he thought would prove highly advantageous.

Mr. Alfred Ordway spoke in favor of such a plan as a gallery and home for the fine arts. Such a one was necessary for the preservation of works of art, and he believed it would be heartily supported by all his brother artists.

Rev. Dr. Miles alluded to the possibility of using the Hancock house for the purpose required, and thought that possibly the site might be made available; yet as this might not give sufficient space, and as the Back Bay would undoubtedly be built over, it would be best to secure some open space there. He felt sure that the spirit of this meeting would be responded to by the public. As he was most interested in historical matters, he thought that even the Historical Society, though well accommodated, would assist in carrying out such a plan. As an aid to agriculture, in showing the increase and perfection of our State crops, it would be of very great value. Such an institution was needed in Boston.

The Chairman spoke of the superiority of European exhibitions of agricultural products in the quantity and quality of the crops. To compete with them, and to do ourselves justice, we want improved methods of cultivation

based on scientific principles, such as would be illustrated and aided by the institution we are speaking of.

General Edmands observed that the Hancock site would be entirely too small for the purpose. From 6 to 12 acres would come nearer to the required space for such a plan.

Mr. Ross said the main thing now was to secure the space, at least four blocks, of 600×250 each. It is not well to come before the legislature with any definite plan, but merely to ask for reservation of sufficient land. The idea of the interest and necessity of such a plan should be disseminated among the people. He repeated that it would greatly increase the value of the other land. Now is the opportunity to get the land, in the vicinity of Boston, and the plans could be matured afterward.

The Chairman remarked that a large space would be required for the exhibitions of the agricultural products. He alluded to the land bill now before Congress, which, if passed, would give the income of 220,000 acres of government land to Massachusetts to be devoted to an agricultural college, if the State would erect the building. Perhaps this income might be devoted to the furtherance of the agricultural departments of this plan.

W. E. Baker, Esq., said that he had conversed with various parties interested, and he thought all would favor this plan. The Water Power Company would be disposed to favor it, taking other land in exchange for their own, if the site selected were upon their domain. The Back Bay Commissioners favor it, and he saw no insurmountable difficulty in carrying it out. In order to act as speedily as possible, he moved that a committee of three be appointed to prepare a memorial to the legislature in favor of reservation of a sufficient space of the Commonwealth land for the purpose of the contemplated Conservatory of Art, Science,

and Historical Relics. This motion was adopted. The following gentlemen were chosen by nomination: Messrs. Edmands, Ross, and Baker.

A committee from the Boston Society of Natural History having been appointed, with full powers to memorialize the legislature for this general purpose, Dr. Cabot moved that the committee have power to request other societies, associations, and gentlemen interested in the plan to prepare memorials to the legislature in aid of that of the Natural History Society. Voted. On motion of Mr. Baker, four other gentlemen were added to the committee, viz.: Messrs. M. P. Wilder, George W. Pratt, Samuel A. Gookin, and A. Ordway.

Amos Binney, Esq., moved that the committee have full powers to prepare and present the memorial with or without calling a meeting beforehand, as they see fit. Carried.

Adjourned to meet at such time and place as the committee may select.

In addition to the gentlemen named above, parties having a large interest in the Boston Water Power Company, the Mill-dam Corporation, the contractors for filling the Back Bay, and many others representing the mercantile interests were present, and great harmony and unanimity of feeling existed as to immediate and decided action.

DR. S. KNEELAND, JR.,
Secretary.

GENERAL INSTITUTE NEWS

CORPORATION NOTES

The two hundred and ninetieth meeting of the Corporation was held at the Institute October 9, 1901. Dr. Francis H. Williams, '73, was re-elected Secretary of the Corporation, and Mr. Alexander S. Wheeler member of the Executive Committee for five years. The standing committees for the current year are as follows:—

General Committees

Executive Committee.—Henry S. Pritchett, George Wigglesworth, *ex officio*; Howard Stockton, Francis H. Williams, Thomas L. Livermore, A. Lawrence Lowell, Alexander S. Wheeler.

Finance Committee.—William Endicott, David R. Whitney, Charles F. Choate, Charles C. Jackson, Nathaniel Thayer, James P. Stearns.

Committee on the Society of Arts.—Howard A. Carson, George A. Gardner, Hiram F. Mills.

Auditing Committee.—Charles C. Jackson, James P. Tolman, William L. Putnam.

Committee on Nominations.—Thornton K. Lothrop, David R. Whitney, George A. Gardner, Howard A. Carson, Francis H. Williams.

Trustees of the Museum of Fine Arts.—Henry S. Pritchett, A. Lawrence Rotch, Francis Blake.

Visiting Committees

Department of Civil Engineering.—Howard A. Carson, Charles F. Choate, John R. Freeman, Eliot C. Clarke, Desmond Fitzgerald, Lucius Tuttle.

Departments of Mechanical Engineering and Applied Mechanics.—Hiram F. Mills, James P. Tolman, Francis Blake, Eben S. Draper, Eliot C. Lee.

Departments of Mining and Geology.—Thomas L. Livermore,

Charles Fairchild, James P. Tolman, Charles L. Lovering, James P. Stearns.

Department of Architecture.—Thornton K. Lothrop, Eliot C. Clarke, John R. Freeman, A. Lawrence Rotch, Robert S. Peabody.

Department of Physics and Electrical Engineering.—Francis Blake, Charles W. Hubbard, A. Lawrence Rotch, Elihu Thomson.

Departments of Literature, History, and Political Economy.—Frank A. Hill, J. B. Sewall, Charles C. Jackson, A. Lawrence Lowell, James P. Munroe.

Department of Modern Languages.—J. B. Sewall, Frank A. Hill, Nathaniel Thayer, Thornton K. Lothrop.

Department of Mathematics.—Percival Lowell, Howard Stockton, William L. Putnam, Charles F. Choate.

Departments of Chemistry and Biology.—Samuel Cabot, Desmond FitzGerald, Francis Blake, Elihu Thomson.

Department of Chemical Engineering.—Arthur T. Lyman, Hiram F. Mills, Samuel Cabot, Charles W. Hubbard, Eliot C. Lee.

Department of Naval Architecture.—Charles J. Paine, Howard Stockton, William H. Lincoln, Charles G. Weld.

APPOINTMENTS

Two important announcements are made in regard to the Faculty. At the time the Institute undertook to give a special course for naval constructors, it was agreed that the department of Naval Architecture be increased by the appointment of an additional professor; and it was naturally desired to secure a trained naval officer for this purpose. In view of the pressure upon the regular *personnel* of the United States Navy, the authorities of the Institute have been notably fortunate in securing the services of Captain William Hovgard, of the Danish Navy, who will begin his duties at the Institute, and will lecture in the present term. Captain Hovgard is a graduate of the Greenwich School (which has been attended in the past by graduates of Annapolis), and has spent some time in the United States in governmental service.

Three members of superior standing in the last graduating class

at Annapolis are already at the Institute, following the new three-year curriculum specially planned for them by the Faculty. In general, they are to take the third and fourth year work of Course XIII., with an additional year of more advanced work, leading to the degree of Master of Science. The appreciation of the work of the department, shown by sending these students to the Institute, is significant; and the progress of the department will be materially promoted by the changes involved.

Another important announcement is the appointment of Professor Henry P. Talbot as head of the department of Chemistry. After graduation in that department Professor Talbot was Assistant and Instructor until 1888, and the following two years continued his studies at the University of Leipsic, receiving the doctor's degree. From 1890 to 1892 he was again Instructor, and has been a member of the Faculty since the latter year. Even before Professor Drown's departure from the Institute, Dr. Talbot had an important share in the administrative routine of the department, and has retained this with increased responsibilities during the intervening years. His immediate charge has been the conduct of the laboratories of Analytical Chemistry, bringing him in contact with nearly all students in the courses including that subject. It is needless to add that this appointment will conduce to better organization and more effective work in the department.

The following appointments have been made in addition to those previously announced:

In Civil Engineering, Messrs. Francis Blair Driscoll and Samuel Lamson Wonson, replacing Messrs. Russell and White; in Mechanical Engineering, Messrs. Henry Lester Kehl, and Harry Ransom White, replacing Messrs. Merrill and Swift; in Mining Engineering, Messrs. John Boyle, Jr., and William Warren Garrett, replacing Messrs. Bugbee and Plummer, Mr. Frederic Henry Sexton, additional; in Chemistry and Chemical Engineering, Messrs. Edward Pierrepont Beckwith and Arthur Colbey Davis, replacing Messrs. Brown and Walton; in Electrical Engineering and Physics, Messrs. Francis Elmore Cady, Frederic William Freeman, Herbert Harley Kennedy, and George Le Roy Mitchell;

in Geology, Mr. Frederick Gardner Clapp; in English, Mr. Henry Latimer Seaver, replacing Mr. Andrews. Mr. William J. Drisko, '95, is reappointed Instructor in Physics, Mr. W. L. Smith retiring from the department.

The new appointees are, in the main, graduates of the class of 1901; but Mr. Kehl, in Mechanical Engineering, comes from Cornell, and Mr. Seaver took his degree at Harvard in 1900, acting as Assistant in English there during the past year.

PRESIDENT'S ADDRESS TO THE FRESHMAN'S CLASS

Following is the President's speech to the class of 1905:—

One of the privileges which comes to those who have to do with the work of instruction is the opportunity, year by year, to enlarge one's acquaintance. This means in most cases to enlarge the number of their friends. It is my pleasant duty to-day to welcome you to the Institute of Technology, to its work, to its associations, and to its friendships. The years that you are to spend here will, I hope, be full of earnest work. I trust they may bring you no less the experience of wholesome companionship and the reward of sincere friendship. In these relations I hope I may have a part. Your student life is not to be isolated from that outside. It is to be a part of it, and a preparation for the work of the world. Earnest as is the life you will wish to lead here, it does not absolve you from the relations of other men,—the relations and the duties of kinship, of the social order of citizenship.

The country in which we live and under whose protection we pursue our several paths in peace and security has, during the past month, passed through a deep experience. It is right that you should, as citizens, share in the problems that such events suggest; and, as I look into your faces, I can but remember the words of the dead President, so recently struck down by the hand of an assassin, spoken as I said good-bye to him a year ago when I came to the Institute. "I hope," he said to me, "that some way will be found to teach the young men in our schools a better estimate of the dignity and honor of serving one's country well, and that in some way they may come to understand that men in high place in government are honestly striving for good ends, and that unworthy purposes are stumbling-blocks, not helps, in a political career. I wish," said he, "that the boys of the country might understand that they are factors in the country's upbuilding, and must learn to take upon themselves its responsibilities."

His death has brought afresh to the attention of all citizens questions of grave import and of far-reaching consequences. It is not my purpose to discuss these

questions in any other way than to echo the President's words and to remind you that they are questions in which you have an interest and a responsibility. Two thoughts occur to me which seem to have special significance for you as students and citizens. It is easy to see that the shot which killed President McKinley was aimed at the destruction of all law and of all authority. Even the dullest citizen of our republic can appreciate that the spirit which stands behind this act is subversive of our whole legal and social order. But it is well to remember that all violations of law tend toward the overthrow of the nation's rights. The corporation which buys from a corrupt city government the franchises which belong to the whole people, the public officer who betrays his trust, the mob which substitutes force for legal process, or which undertakes to administer justice by mob trial, is sowing the seed whose fruit is anarchy. Obedience to law is a heritage which our race has acquired only after centuries of struggle, and any violation of the law is a sin against the rights of all.

Let us remember, even as students, one other thing. The question before the American people to-day is not whether the government can suppress anarchy or bribery or municipal corruption or how to deal with any one of the problems which confront it. It is the old question which has been before us these hundred and twenty-five years, and it is a part of the very nature of our republican institutions. That question is, Will the body of our citizens give intelligent and conscientious thought to problems of citizenship? With an intelligent citizenship all these problems can be patiently and successfully met. They can be met successfully only by such a citizenship, and therefore, if I may say one word to you at the beginning of your life here which I should be glad to leave with you, it is this : While you are learning to be engineers, do not forget that you are citizens of the republic, and share its responsibilities.

As to your life here, I can at least say this : The Institute of Technology is a place where men come first of all for work and study. I trust you may find this atmosphere to be to your liking, and that you will undertake your life here in that spirit. But I shall be disappointed if you do not also find here that which ministers not only to work, but to scholarship and to culture, and that the associations with the professors and instructors, as well as with each other, may be helpful to you in your relations with men as well as in the pursuit of the particular branch of applied science which you are to follow.

There is a vast difference between training and education. A man may be a highly trained engineer, and yet remain uneducated in the best and broadest sense. I commend to you the ambition to be educated engineers as well as to be trained engineers. You will find among professors and instructors every wish to assist and to encourage. I beg to assure you of my own desire to share your confidence and your friendship. There is no work which I can do in the Institute of Technology so important as that which brings me in touch with your life and your difficulties and your aspirations. You can do me no greater

pleasure than to come to me for a word of consultation or advice, and to admit me to your friendship.

ENTRANCE EXAMINATIONS

In spite of the extreme heat at the time of the June examinations the results were not unfavorable to the prospective size or quality of the entering class. The number admitted is considerably larger than the unprecedented class of last year, and bids fair to be further increased by the September accessions, while the increase in the number of preliminary applicants offers encouragement for next year.

The experiment of holding examinations in England produced no large result numerically, although expressions of interest were abundant, and appeared to warrant expectations of larger numbers in future years.

REGISTRATION

The registration of students for the new year is beyond all anticipation, being already in excess of fourteen hundred,—an increase of about one hundred and fifty over last year. Fortunately, the effect of this increase is so distributed as not to cause disastrous congestion in any particular department, although local crowding is an inevitable result. Some relief has been given by the use of the lower two floors of the former Technology club-house, 71 Newbury Street, for recitation rooms in language and mathematics; and during the summer two of the rooms in the Engineering Building have been combined to provide for larger classes than were anticipated in planning the building. Several classes have outgrown their usual accommodations, and until the new Electrical Engineering Building is erected there will be little margin of space.

The following is a partial list of colleges represented by students entering the Institute for the first time this year. Of these ninety-two men, thirty-two have degrees.

Adelbert College, one; Amherst College, three; Acadia College, one; Armour Institute, two; Baylor Institute, one; Beloit College, one; Boston College, one; Boston University, one; Brooklyn

Polytechnic Institute, one; Brown University, two; Buchtel College, one; University of Cambridge, one; Cansius College, one; Central College, one; University of Chicago, one; Christian Brothers College, one; Clarkson School of Technology, one; Colby College, one; Colgate University, one; Colorado State College of Mines, one; University of Colorado, one; Columbian University, two; Connecticut Agricultural College, one; Cornell University, one; Dartmouth College, two; Davidson College, one; Detroit College, one; Earlham College, one; Georgetown University, one; Georgia School of Technology, one; University of Glasgow, one; Harvard University, three; University of Illinois, one; State University of Iowa, one; Johns Hopkins University, five; Kalamazoo College, one; Lawrence Scientific School, one; Leland Stanford Jr. University, one; Lewis Institute, one; Lincoln University, one; University of Maine, one; Mercer University, one; Michigan College of Mines, one; University of Minnesota, two; Missouri State University, one; Mt. Alleston College, one; University of North Carolina, one; Oberlin College, one; Ohio State University, three; Pennsylvania Military College, one; Pennsylvania State College, one; Pomona College, one; Rensselaer Polytechnic Institute, one; University of Rochester, one; St. Ignatius College, one; St. Joseph College, two; Sheffield Scientific College, two; Smith College, one; Swarthmore College, one; Texas Agricultural and Mechanical College, two; Trinity College, one; Virginia Military Institute, two; University of Virginia, two; University of Washington, one; University of Wesleyan, two; Western University of Pennsylvania, two; Williams College, one; University of Wisconsin, one; Yale University, two.

FACULTY NOTES

Professors Cross, Talbot, and Goodwin have spent the greater part of the summer in Europe, devoting some time to visiting chemical and physical laboratories. Professor Puffer has more recently gone abroad, with temporary leave of absence, with a view to studying electrical laboratories as a partial basis for plans for the

new electrical building. Professor Wells returns after a year's leave of absence much improved in health, and resumes his class work in mathematics. Professors Despradelle, Hofman, Barton, Rambeau, and Tyler and Mr. George have also spent a considerable portion of the summer in Europe; while Professors Bartlett, Noyes, and Derr, and Mr. Lawrence have explored Japan, joining forces in part with members of the returning Eclipse Expedition. We regret to add that Professors Hough and Sondericker are temporarily prevented by ill-health from resuming their work.

Professor Ripley has been appointed lecturer in economics at Harvard University for the current year. He will assume charge of certain courses formerly given by Professor Ashley, who has resigned, and accepted a professorship at the University of Birmingham, Eng. Professor Ripley will give a course in Railroad Economics in the first half-year, and another on the Industrial and Commercial Condition of Europe, during the second term, as well as a half-course in Statistics. It is hoped that both the first and second of these courses may be regularly introduced at the Institute in due time, in connection with other plans for modifying and adapting the economic work to the peculiar needs of our students.

WALKER MEMORIAL

The summer has naturally been a period of limited activity in connection with the Walker Memorial. Announcement was made in the July REVIEW of the gratifying completion of the \$100,000 alumni subscription on Graduation Day. The Alumni Committee, appreciating the necessity of larger funds, if the Memorial is to be adequate to its object, will continue to receive subscriptions, believing that the interest of alumni will not cease until the present plans of President Pritchett and the committee can be completely fulfilled.

Meanwhile the architectural plans for the Memorial are receiving more mature and thorough study, and such temporary delay as may be necessary will not fail to bear fruit in the final result.

GIFTS AND REQUESTS

The will of George W. Armstrong, of Boston, bequeaths \$5,000 to the Massachusetts Institute of Technology, to be called "the George Robert Armstrong Fund," in honor of his only son.

Models of the 2,970-ton six-masted schooner, "George W. Wells," and of A. S. Bigelow's steam yacht, "Pantooset," have been added to the collection of the Naval Architecture Department.

LOWELL FREE COURSES

The following lecture courses are offered by members of the Institute Faculty for the ensuing year by the Lowell Institute:—

Methods of Calculating Earthworks.—Twelve lectures by Professor C. Frank Allen, on Monday and Thursday evenings at 7.45, in Room 21, Rogers Building, beginning November 11.

Descriptive Geometry.—Twelve lectures by Associate Professor Linus Faunce, on Monday and Thursday evenings at 7.45, in Room 27, Rogers Building, beginning November 11.

The Method of Least Squares, with Applications to Engineering Problems.—Twelve lectures by Associate Professor Dana P. Bartlett, on Tuesday and Friday evenings at 7.45, in Room 26, Rogers Building, beginning November 12.

Queen Anne Literature.—Twelve lectures by Professor Arlo Bates, on Tuesday and Friday evenings at 7.45, in Room 22, Walker Building, beginning November 12.

Financial History of the United States.—Twelve lectures by Professor Davis R. Dewey, on Tuesday and Friday evenings at 7.45, in Room 22, Rogers Building, beginning November 12.

Applied Mechanics for Architects, Engineers, and Builders.—Twelve lectures by Assistant Professor William A. Johnston, on Tuesday and Friday evenings at 7.45, in Room 21, Engineering Building A, beginning November 12.

The Elements of Organic Chemistry.—Twelve lectures by Assistant Professor James F. Norris, on Tuesday and Friday evenings at 7.45, in Room 24, Walker Building, beginning November 12.

Navigation and Nautical Astronomy.—Twelve lectures by Professor Alfred E. Burton, on Monday and Thursday evenings at 7.45, in Room 26, Rogers Building, beginning January 6.

Principles and Applications of the Calculus.—Twelve lectures by Assistant Professor Frederick S. Woods, on Monday and Thursday evenings at 7.45, in Room 22, Rogers Building, beginning January 6.

The Electric Telegraph: An Outline of its Development, and an Analysis of Present Methods of Simplex, Duplex, Quadruplex, and Multiplex Working, including Recent Progress in High-speed and Wireless Telegraphy.—Twelve lectures by Assistant Professor Louis Derr, on Tuesday and Friday evenings at 7.45, in Room 22, Walker Building, beginning January 7.

Elements of Mechanism.—Twelve lectures by Assistant Professor Charles F. Park, on Tuesday and Friday evenings at 7.45, in Room 21, Engineering Building A, beginning January 7.

The French Drama in the Second Half of the Nineteenth Century (continued).—Twelve lectures in French by Professor Adolph Rambeau, on Tuesday and Friday evenings at 7.45, in Room 23, Walker Building, beginning January 7.

The Sculpture and Painting of the Gothic Age and of the Early Renaissance.—Twelve lectures by Assistant Professor John O. Sumner, on Tuesday and Friday evenings at 7.45, in Room 11, Rogers Building, beginning January 7.

Lessing, der Reformator der Deutschen Litteratur.—Twelve lectures in German by Associate Professor Frank Vogel, on Wednesday evenings at 7.45, in Room 11, Rogers Building, beginning February 5.

Volcanic Action, Past and Present: Its Relation to the History of the Earth and to the Topography of the Earth's Surface.—Twelve lectures by Assistant Professor George H. Barton, on Monday and Thursday evenings at 7.45, in Room 11, Engineering Building B, beginning February 11.

The Metallurgy of Iron and Steel.—Twelve lectures by Professor Heinrich O. Hofman, on Monday and Thursday evenings at 7.45, in Room 2, Rogers Building, beginning February 17.

Ore Deposits.—Twelve lectures by Assistant Professor William O. Crosby, on Tuesday and Friday evenings at 7.45, in Room 11, Engineering Building B, beginning February 18.

Chemistry and Physical Properties of Materials of Engineering.—Twelve lectures by Assistant Professor Henry Fay, on Tuesday and Friday evenings at 7.45, in Room 24, Walker Building, beginning February 18.

Industrial Chemistry.—Twelve lectures by Assistant Professor F. H. Thorp, on Wednesday and Saturday evenings at 7.45, in Room 11, Engineering Building B, beginning February 19.

Technical Heat Measurements.—Twelve lectures by Assistant Professor Charles L. Norton, on Tuesday and Friday evenings at 7.45, in Room 22, Walker Building, beginning February 25.

THE UNDERGRADUATES

THE TECH

The *Tech* staff at the beginning of the year 1901-1902 is as follows: Howard Scott Morse, 1903, editor-in-chief; I. Rayne Adams, 1902, secretary; H. W. Maxson, 1901; P. G. L. Hilken, 1901; C. A. Sawyer, Jr.; E. B. MacNaughton, 1902, art editor; Arthur Smith More, 1902, business manager; and David Elwell, 1904, assistant business manager.

Y. M. C. A. RECEPTION

On the evening of October 4 the members of the Freshman Class were tendered a reception in the library of Rogers Building by the M. I. T. Y. M. C. A. The reception was wholly informal. During the evening President Pritchett made a few remarks, which were warmly applauded. Professor Porter was then introduced, and spoke briefly on the work of the Y. M. C. A. in

the Institute. Refreshments were served; and the evening was a most successful one.

ATHLETICS

The football team opened its season with Holy Cross of Worcester at Charles River Park, October 9. The Worcester team won 15 to 0. The line-up was as follows:—

<i>Holy Cross.</i>	<i>Mass. Inst. Tech.</i>
Kelly, l. e.	r. e., Hooker
Noone, l. t.	r. t., Doran
O'Neil, l. g.	r. g., Homer
O'Boyle, c.	c., Raymond
Foley (Rice), r. g.	l. g., Hunter
Lawler (Campbell), r. t.	l. t., Ross
Stanhard, r. e.	l. e., McGill
Larkin, q. b.	q. b., Hill
Kelly, l. h. b.	r. h. b., Wood
Baldwin, r. h. b.	l. h. b., Bruton
Reed, f. b.	f. b., Metcalf

Score: Holy Cross, 15; M. I. T., 0. *Touchdowns:* Reed, 2. *Goal from Field:* Baldwin. *Umpire:* Murphy. *Referee:* Crolius. *Linesmen:* Sullivan and Smith. *Time,* 15 m. halves.

"Football at the Massachusetts Institute of Technology has been abolished for this year, and probably forever. The students so voted at a mass meeting held October 9, at which President Pritchett presided.

"After the matter of a substitute for the cane rush had been decided, the question of football was brought up. Henry K. Hooker, '02, captain of the 'varsity eleven, said that, if football was to continue and the team be successful, the students must give it their support both financially and by attendance. He said that in the last few years the students had taken very little interest in football, even when they were home games.

"President Pritchett also talked to the students, and said that personally he was in favor of abolishing football, owing to lack of time for practice, and because so little interest was taken.

"The question was then put to a vote; and it was decided, 119

to 112, that there should be no more football at Technology this year. Although the number of students who voted, 231, is a small proportion of the entire body,—nearly 1,400,—it is, perhaps, the opinion of the majority on the matter, as notices of the meeting had been posted for nearly a week.

“The immediate result of the meeting was the disbanding of the football team after the game with Holy Cross, which resulted in a defeat for Technology, 15 to 0. At the gymnasium, after the game, Captain Hooker assembled the men in the janitor’s room, and formally disbanded the team. This means that Technology will cancel all games scheduled with Brown, Amherst, Tufts, and other colleges, and the only football game at Technology this fall will be the annual one between the Freshmen and Sophomores.

“There is considerable difference of opinion among the players as to whether it is right, after having arranged a schedule, hired a coach, etc., that football should be abolished. One man considered the step a great mistake, and thought Technology would have a team next fall.”—*Boston Herald*.

STATE SCHOLARSHIPS

The following State scholarships for the year 1901–1902 have been awarded:—

Berkshire district: Homer Eugene Bartlett, North Adams.

Berkshire and Hampshire district: Eleanor Packer Rathbun, Southampton.

First Bristol district: James Allerton Cushman, Taunton, half-scholarship; LeRoy Boardman Gould, Taunton, half-scholarship.

Second Bristol district: Frank Stetson Wilson, Roxbury, half-scholarship; Webster Haverstock Taylor, Roxbury, half-scholarship.

Third Bristol district: James Madison Gammons, Acushnet.

Cape district: Cyrus Pierce Howes, South Yarmouth, half-scholarship; Gorham Crosby, Barnstable, half-scholarship.

First Essex district: Charles Henry Boardman, Jr., Lynn, half-scholarship; Henry Kneeland Richardson, Lynn, half-scholarship.

Second Essex district: Abel Martin Hamblet, Salem, half-scholarship; Humphrey Matthew Haley, Salem, half-scholarship.

Third Essex district: Alfred Edward Tadgell, Salem, half-scholarship; Joseph Daniels, Boston, half-scholarship.

Fourth Essex district: Royal Linfield Wales, Haverhill, half-scholarship; Ralph Waldo Eaton, Haverhill, half-scholarship.

Fifth Essex district: James Evans Barlow, Lawrence.

Franklin and Hampshire district: Harry Gardner Chapin, Greenfield.

First Hampden district: Clark Albert Bryan, Springfield.

Second Hampden district: Roger Philip Ingalls, Lexington.

Middlesex and Essex district: Stephen Nickerson Mason, Wakefield.

First Middlesex district: Philip Starr Sweetser, Newton Highlands, half-scholarship; Leonard Wolsey Cronkite, Newton Centre, half-scholarship.

Second Middlesex district: Edward Andrew Barrier, Cambridgeport, half-scholarship; Frank Charles Starr, Cambridgeport, half-scholarship.

Third Middlesex district: George Herbert Shaw, Belmont, half-scholarship; David Elwell, Arlington, half-scholarship.

Fourth Middlesex district: Guy Hill, Everett.

Fifth Middlesex district: Franklin Livingstone Hunt, Waltham, half-scholarship; Robert Nathaniel Turner, Waltham, half-scholarship.

Sixth Middlesex district: Rufus Mason Whittet, Lowell, half-scholarship; Ralph Edgar Havens, Littleton, half-scholarship.

Seventh Middlesex district: William Livingston Spalding, Lowell.

First Norfolk district: James Albert Pitts, Wollaston, half-scholarship; Jeremiah John Donovan, Randolph, half-scholarship.

Second Norfolk district: Bernard Winslow Capen, Stoughton, half-scholarship; Henry Hammett Fales, Norfolk, half-scholarship.

First Plymouth district: Thomas Shaw, Plymouth.

Second Plymouth district: Howard Leslie Stevens, Middleboro.

First Suffolk district: Arthur Thomas Nelson, East Boston, half-scholarship; Arthur Parkman Rice, Chelsea, half-scholarship.

Second Suffolk district : George Curtis Capelle, East Cambridge, half-scholarship ; Joseph Allen Haraden, Charlestown, half-scholarship.

Third Suffolk district : Harry Levine, Boston.

Fourth Suffolk district : Walter Nathan Munroe, Roxbury.

Fifth Suffolk district : Benjamin David Solomon, Boston, half-scholarship ; Harry Vincent Doherty, Boston, half-scholarship.

Sixth Suffolk district : Walter Louis Cronin, South Boston.

Seventh Suffolk district : Edna May Williston Best, Roxbury, half-scholarship ; Albert Pierce Weymouth, Dorchester, half-scholarship.

Eighth Suffolk district : August Edward Theodore Anderson, Roslindale, half-scholarship ; Robert Wilbur Morse, Jamaica Plain, half-scholarship.

Ninth Suffolk district : Duncan Rogers Franklin, Brighton, half-scholarship ; John Edward Lynch, Jr., Boston, half-scholarship.

First Worcester district : Florence Louise Wetherbee, Worcester.

Second Worcester district : Edward Louis Edes, Bolton, half-scholarship ; Arthur Howard Abbott, Clinton, half-scholarship.

Third Worcester district : Myron Wilkinson Dole, Fitchburg, half-scholarship ; Irving Henry Cowdrey, Fitchburg, half-scholarship.

Fourth Worcester district : Clarence Mason Allen, Barre.

Fifth Worcester district : Isadore Niditch, Boston.

THE GRADUATES

THE TECHNOLOGY CLUB

The service of the club was suspended from August 7 to 13, while removing from 71 Newbury Street to 83 Newbury Street; but the new house was thrown open promptly on the morning of the 14th, and within a day or two, through the energy of the House Committee and the steward and his staff, everything was running smoothly. The new house is a great improvement in every way over the old, the increase in the size of the dining-room and the billiard-room being highly appreciated. The remodelling, decoration, and furnishing of the house were given entirely into the hands of those members of the House Committee who were also architects, Messrs. Walter H. Kilham and Harry W. Gardner; and the result reflects high credit upon their skill and taste. In addition to the pictures and other ornaments which the club had already received as gifts or loans from its members and from certain graduate classes, the new house contains many new paintings loaned by Messrs. Charles H. Davis, Charles L. Adams, Ross Turner, Desmond FitzGerald, and Webster Wells, and by Mrs. Charles C. G. Thornton. The oils have been hung in the "Common Room," the water-colors in the dining-room, and the etchings and carbons in the ladies' dining-room, the "Quiet Room," and the halls. The club is most fortunate in the possession of so many beautiful works of art.

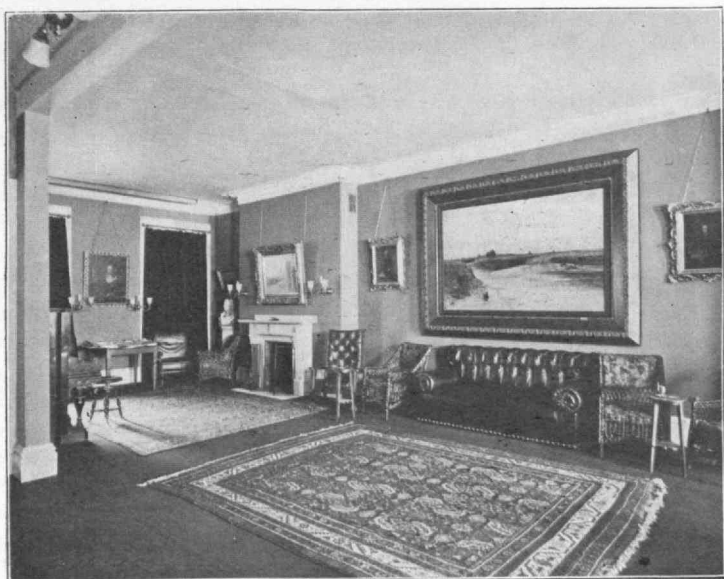
During the summer were bound and placed upon the shelves as complete sets as it has been possible to obtain of the Institute's serial publications. This work has been done with a balance of the fund collected several years ago from members of the club for the purchase of the replica of Mr. French's bust of the late President Walker, which is so conspicuous an ornament of the common room. The collection is a valuable one, containing a complete file of the Annual Catalogues of the Institute, of the President's



The New Technology Club.



The Billiard Room.



Rear of "Common Room."

Reports, of *Technique* and the TECHNOLOGY REVIEW, and measurably complete files of the Proceedings of the Society of Arts, the *Technology Quarterly*, and *The Tech.* These sets will be filled out as fast as it is possible to secure the missing numbers, and the volumes will be suitably inscribed as a part of the club's memorial to General Walker.

During September the following notices relative to the service of the club were sent to members : —

IMPORTANT NOTICE TO MEMBERS

Through the courteous co-operation of the Massachusetts Institute of Technology the Club has secured for the coming year the use of six bedrooms at its former house, 71 Newbury Street, in addition to the three bedrooms available at its new house, 83 Newbury Street.

Although some of these rooms will be rented to members for the entire season, a sufficient number (including all those at the present house) will be kept for transient use, so that members wishing a room for a week or less may be almost certain of securing one, even without previous notice ; although it is always better, if possible, to write, telegraph, or telephone (" Back Bay 195 ") to the Steward at least one day in advance.

The charge for a room is one dollar a day, and a *table d'hôte* breakfast is served for forty cents.

In order that the Club may be of the utmost service to its members, they are strongly urged to make as much use as possible of this feature, and to make it a rule, when they have occasion to remain over night in Boston, to put up at the Club instead of at a hotel.

Attention is called in this connection to the following House Rule : —

"8. Persons residing more than twenty miles from Boston, and having no place of business therein, may be introduced by members to the Club-house for a single day, or to any meeting of the Club, either personally or by card of introduction ; and any member of the Executive [Committee may invite such a person, at the request of any member, to use the Club-house for a fortnight. The Executive Committee may by vote extend such invitation to any such person for a month ; and between any two consecutive meetings of the committee this power may be exercised by the President or Secretary."

INCREASED PRIVILEGES FOR LADIES

In compliance with the wish of many members, the experiment is to be tried, for six months, of admitting ladies to lunch and dinner at the Club every day.

A special dining-room (corresponding to the "Strangers' Room" at 71 Newbury Street, and overlooking the Boylston Street campus of the Institute) is reserved for them; and this part of the Club-house will be open to members accompanied by ladies, *or to ladies presenting the visiting card of a member*, from 12 M. to 2 P.M. and from 6 to 8 P.M. every day.

On the evenings of "Smoke Talks," however, the dinner privilege will be suspended.

There is a dressing-room for ladies on the third floor of the Club-house.

The first "Smoke Talk" of the season of 1901-1902 was given on Monday, October 14 (in connection with the annual meeting), by Professor Alfred E. Burton, who gave an account of the Institute Expedition to Sumatra to view the eclipse of last May. The talk was illustrated by many fine photographs taken by members of the party. It is proposed to continue these talks at approximately fortnightly intervals throughout the winter and spring. Among those who have agreed to speak are President Pritchett; Mr. William Barclay Parsons, chief engineer of the New York Subway (who will give an illustrated talk on his experiences as an engineer in China); Dr. Booker T. Washington; President Remsen, of Johns Hopkins University; Professor George E. Hale, of the Yerkes Observatory; and a member of the "Institute Japan Party." There will also be a dramatic performance by some of the principals of the Walker Club Plays and the Tech Shows, a concert by the Glee, Banjo, and Mandolin Clubs, and one or two other musical evenings. For "ladies' nights" there will be, among others, an impersonation by Mr. Leland Powers, whose "David Garrick" was such a tremendous success last winter; an impersonation (a dramatization of "To Have and to Hold") by Miss Katherine Jewell Everts; and an illustrated lecture on "Tripoli," by Mrs. Mabel Loomis Todd.

The success of all illustrated lectures will be greatly enhanced by the new electric lantern, which was used for the first time at Professor Burton's talk. This lantern is the generous gift of the members of the Instructing Staff of the Institute, and is an exceptionally fine one.

The vacancies in the club membership created by the vote of

the Council increasing the limit of resident membership to five hundred are rapidly filling up, and applications are coming in from the undergraduates for the sixty vacancies open to them. It has been decided that college graduates taking undergraduate courses at the Institute shall be counted as resident, not as undergraduate, members, though they will be asked to pay only the undergraduate fees.

At the annual meeting held at the club-house on October 14 the following officers were elected: president, James Phinney Munroe, '82; vice-president, Francis Henry Williams, '73; secretary, Walter Humphreys, '97; treasurer, Walter Elbridge Piper, '94; members of the Council for one year: Albert Farwell Bemis, '93; Frank Lovering Locke, '86; Edward Galbraith Thomas, '87; Edwin Child Miller, '79; George Wilmarth Sherman, '94; members of the Council for two years: Calvin Frank Allen, '72; Dana Prescott Bartlett, '86; Arthur Tisdale Bradlee, '88; Walter Harrington Kilham, '89; William Zebina Ripley, '90; members of the Council for three years: Walter Owen Adams, '99; William Wyman Crosby, '93; John Oviatt De Wolf, '90; George Otis Draper, '87; Frank George Stantial, '79.

As is customary, the secretary's report for this year is, in the main, a list of statistics. There have been printed, from time to time in the REVIEW, complete lists of the "Smoke Talks" and Club evenings. During the last year there have been fifteen entertainments, with an average attendance of 104, with a maximum of 160, and a minimum of 50. To five of the entertainments ladies have been invited.

The present membership of the club is 601, made up of:—

Corporation (not alumni)	16	
Instructing staff (not alumni)	31	
Graduates and non-graduates	501	
Undergraduates	53	601
Resident	340	
Non-resident	261	601

In the year of Oct. 1, 1900, to Oct. 1, 1901, there have been admitted 82 members, as follows : —

Honorary	1	
Corporation	0	
Graduates and non-graduates	24	
Instructing staff (not alumni)	6	
Undergraduates	51	82
	<hr/>	<hr/>
Resident	78	
Non-resident	4	82
	<hr/>	<hr/>

The membership has been diminished by 35, as follows : —

Resigned	23	
Dropped from membership	10	
Deceased	2	35
	<hr/>	<hr/>

NEWS FROM THE CLASSES

1877.

RICHARD A. HALE, *Sec.*

Lawrence, Mass.

John Alden has been for the past year, and is at present, on the board of trustees of Abbot Academy, Andover.—The Maryland Steel Company, of which F. W. Wood is president, is about putting in a large coke plant similar to the one at Everett, Mass.

1880.

PROF. GEORGE H. BARTON, *Sec.*

Mass. Inst. of Technology, Boston.

George H. Barton and wife spent the summer in Europe, visiting Holland, Belgium, Germany, Switzerland, France, England, Scotland, and Wales. His autumn field class of Teachers began with a great deal of enthusiasm, and an attendance of over sixty. North Adams was visited on October 5 as a special region of great geological interest.

1882.

WALTER B. SNOW, *Sec.*

Watertown, Mass.

Harry G. Manning, who has recently been engaged upon the

Chicago plant of the Simonds Manufacturing Company, will be the erecting engineer for English parties in connection with a large steel mill near Pittsburgh, Pa.—John F. Low and Elizabeth B. Wadsworth were married at Duxbury, Mass., September 4. They will reside at 89 Clarke Avenue, Chelsea, Mass.—James E. Chapman, of Evanston, Wyo., was in the east during the summer.—James W. Johnson, city engineer, Riverside, Cal., has under consideration a change of position which will give him a controlling interest in an old established electrical and machinery supply house.—Francis P. Hall has returned to the east after many years of life in Kansas. He married at Boston on June 20 Miss Maud Moore of Emporia, Kan. Mr. and Mrs. Hall intend to live near Boston, and at present are engaged in inspecting various possible locations.—The interest of the class centres in certain buildings at the Pan-American Exposition, designed by George F. Shepley, a special student

with the class in 1880 and 1881. His Manufactures and Liberal Arts Building and its companion, the Agricultural Building, both facing upon the Court of the Fountain, are among the most prominent structures. These buildings, measuring respectively 500 feet by 350 feet and 500 feet by 150 feet, present in exterior design, as stated in the catalogue of buildings, "a free treatment of Spanish Renaissance, the idea being to give by means of color and decoration an expression of gayety and lightness as far removed as possible from the serious buildings of other exhibitions given in this country."

1883.

HARVEY S. CHASE, *Sec.*

8 Congress Street, Boston.

At Chicago, in August, the secretary and Ike Litchfield of '85 had much festivity. Pierce of '85 also took a hand, and put up the secretary at the River Forest Golf Club. While there are no active members of '83 in the Windy City, any visiting classmate will do well to look up Ike and Pierce. — At the Buffalo Fair, David Wesson

Company's exhibit is notable. Married members must note these products particularly and use them exclusively, for the honor of the class. — Eppendorff has been summering at East Aurora, the home of Fra Elbertus and the *Philistine*. Don't fail to look him up during your visit to the Fair this Fall. He is back in Buffalo by this time. — Foran has been working nights and Sundays on various large pieces of hydraulic work during the spring and summer. — Gale has decided that his duty as a politician is completed, and stands ready to let any other member who desires step into his shoes at the Great and General Court next year. Pity about this, for the State needs him and others like him. — Chase has been retained as consulting expert upon the reorganization and systematizing of the municipal accounts of the city of Chicago, a piece of work which will require him to be back and forth for the next year and a half. — The secretary recently received a photograph of the new automobile which the Ward Leonard Electric Company are turning out at Bronxville, N.Y. — William B.

Fuller is now in charge of the construction of a mechanical filter plant for the East Jersey Water Company at Little Falls, N.J. This plant is the largest of its kind in the world, and presents many novel features both in concrete construction and in the detail arrangement of the filters. — On May 1 Frank Tenney was made secretary of the Pennsylvania Steel Company in addition to his present duties as assistant to the president. Therefore, a portion of his time is spent in Philadelphia, where the executive offices are. — On August 4 Hollis B. Page died at Richmond, Me.

1884.

DR. AUGUSTUS H. GILL, *Sec.*
Mass. Inst. of Technology, Boston.

Rotch has been successful in flying a kite when there is no wind, by making use of a tug-boat. Hargreave kites were used, and heights of over 2,600 feet attained. Complete meteorological records were obtained, which showed that — contrary to the usual impression — the atmospheric conditions above the ocean are practically the

same as those above the land. This method of kite-flying enables records to be taken at any time, and the observer can now work under nearly all conditions of wind and weather. According to *Science* he has been pursuing his meteorological investigations abroad; for he, as "the American member of the International Aeronautical Committee," made a balloon ascension from Strasburg, Germany, with his colleague, Professor Hergesell, on July 4, in connection with the eighteenth series in Europe. They reached a height of about 14,000 feet. The meteorological observations will be published in the *United States Monthly Weather Review*. — Rich has had the misfortune to lose his youngest boy. — Horton is one of the selectmen of Canton, Mass.

1885.

PROF. E. B. HOMER, *Sec.*
Rhode Island School of Design,
Providence, R.I.

Mr. F. H. Newell, chief hydrographer of the United States Geological Survey, has returned from an inspection trip to Colorado, Utah, Idaho,

and Oregon. In the latter State he made a rapid reconnaissance, starting from the Dalles and driving up Deschutes River, then easterly along Crooked River, and down Malheur River, a distance of about five hundred and twenty-five miles. On this trip he was accompanied by Mr. Gifford Pinchot, chief of the Forestry Bureau, and by Hon. Malcolm A. Moody, member of Congress from Eastern Oregon. The conditions of the water resources and the possibilities of storage were considered, and the character and importance of the forestry growth on the mountains adjacent to the desert areas.

1888.

WILLIAM G. SNOW, *Sec.*

245 No. Broad St., Philadelphia, Pa.

B. R. T. Collins announces the arrival in his family of a daughter, Dorothea, on June 5, the day following his arrival in Chicago with the ship "Dorothea," which, as stated in the last number of the REVIEW, he brought from Philadelphia to the Lakes with a crew of Illinois Naval Reserves. They had an interesting and eventful voyage

of twenty-five days, visiting the Pan-American Exposition, and receiving a grand ovation on their arrival in Chicago.—J. W. Loveland has purchased a lot and will erect a summer cottage at Megansett, Mass., situated on Buzzards Bay.—A. H. Sawyer has been very ill with typhoid fever during the summer.—Stephen Childs, in partnership with John C. Runkle, is manager of the Gordon Farms at New Dorp, Staten Island, N.Y.—The *Electrical World and Engineer* of September 28th, under the title of "Electrical Engineers of the Day," publishes a biographical sketch, with portrait, of Louis A. Ferguson, the new president of the Association of Edison Illuminating Companies.

1889.

WALTER H. KILHAM, *Sec.*

9 Park Street, Boston.

Frank A. Laws was married at Salem, August 29, to Miss Harriet Patterson Burbank. They are to reside at 81 Essex Street, Salem.—The following are extracts from a letter recently received by a member of the class from Jasper Whit-

ing (Mr. Whiting left the United States about a year ago, his intention being to circle the world and to remain absent a couple of years): "It would take too long to attempt to tell you of the many experiences and exciting times that I have had since I left America. You know I did not expect to come to China right away when I started; but, when I got to England and found all London excited over the supposed massacre of the ministers in Peking, I felt as if I should like above all things to see something of the scrap, and so, after much trouble, got myself appointed special war correspondent for a London paper, and started forth. Unfortunately, I was just too late to be with the troops at the relief of Peking; but I was in time to witness the looting of the city. . . . I never had such an interesting time before, and do not expect to again for a long time. Then I went with the troops on several of the campaigns into the interior of China, sleeping in tents and on the ground for nearly three months and eating army rations, until I broke down with fever, and had to go to the

hospital. Of course, as I was playing correspondent, I wrote everything up; and, although it was hard work, it was mighty interesting. Li Hung Chang gave me a long interview, as did also the Viceroy of . . . and several other personages. After things calmed down, I went back to Shanghai leisurely by way of Siberia, Korea, and Japan, and then started on a southern trip through the Philippine Islands and to Borneo. Our new possessions are full of great possibilities. It is a beautiful country, and a rich one, too, although I should not care to have to work hard there, because it is so very hot. During my trip, I visited most of the large islands, and saw about all there was on exhibition. . . . From Borneo I went to Singapore, and then to Siam, and now I am in the capital of French China. Saigon is the only clean city that I have seen since I left Europe. It is a regular little Paris, with broad boulevards, handsome public buildings, and any number of little cafés and restaurants, where one can get better things to eat than in any other public place in the Far East. But I am

lonely. There is not a soul in town that talks English, and what I remember of the French I learned at Tech is hardly sufficient to keep me from dying of hunger." . . .—Cilley's address is 84 Broadway, Brooklyn. He is employed on the engineering corps of the new East River bridge, and reports that he was the first man to walk across the foot-bridge from New York to Brooklyn and back. The nature of this feat will be better understood when it is known that the top laterals of the span are only seven inches wide, forty feet from point to point of support, 160 feet above the water, and are without side supports. These are walked daily by the men at work on the bridge. There are two foot-bridges fifty feet apart, with a truss eight inches wide and 270 feet above the water crossing from one to the other, without side supports; and this, too, is daily crossed as a part of the work. The towers and short spans are complete; and the foot-bridges, which act as scaffolding for the building of the cable, are complete, and the building of the cables under way.—A good number of replies have been received to the questions sent out by the secre-

tary. To make the proposed Class Book a success, however, every man in the class should answer, and not forget the assessment, without which the book cannot be printed.

1890.

GEORGE L. GILMORE, *Sec.*

Lexington, Mass.

Andrew W. Woodman has contributed to the *Journal of the Association of Engineering Societies* (for February, 1901) a paper on "Tests of Roebling Fireproof Floors." The paper had previously been presented at a meeting of the Boston Society of Civil Engineers.

1891.

CHARLES GARRISON, *Sec.*

Lexington, Mass.

"Mr. Morris Knowles, Assoc. M. Am. Soc. C. E., has been appointed engineer in charge of the water filtration work at Pittsburg in place of Mr. William F. Miller, resigned. Mr. Knowles graduated from the M. I. T. in 1891, and has since then been mainly engaged professionally in water-works design and construction, and politically also; for he was for some years a member of the

Water Board of Lawrence, Mass., where one of the first American sand filters was built. He has been connected with the East Jersey Water Company and the filtration investigations at Pittsburg and Philadelphia; and his appointment is one reflecting credit on the judgment of Mr. E. M. Bigelow, the director of public works" (from *Engineering Record*, vol. 44, p. 137, August 10, 1901).—James W. Pierce has resigned his position as superintendent of parks of the city of Havana, Cuba, and is about to go into the fruit-raising business there. It is not stated whether he has the full use of the parks for this purpose or not.—K. William Mansfield is now established at Savannah, Ga., as "The Moynelo and Mansfield Company." As they use eight cable codes in their business, their foreign affairs must be of a very large and flourishing nature.

1892.

PROF. SEVERANCE BURRAGE, *Sec.*
Purdue University, Lafayette, Ind.

Walter M. Newkirk and Miss Alice M. Field of Detroit were married on the 11th of last June. Their home address is

"The Francis," East Canfield Avenue, Detroit, Mich.—Philip M. Burbank, formerly in the city engineer's office at Waltham, has entered the employ of Messrs. Stone & Webster, electrical engineers of Boston.—Sumner B. Ely, recently "mechanical engineer," is now "chief engineer" of the American Steel Company of Pittsburg.—Course I. men will be interested to know that Elmer G. Manahan, who for some years past has been with the Metropolitan Water Board of Boston, has resigned his position to become engineer in the Bureau of Filtration at Pittsburg, Pa. Mr. Morris Knowles of the class of '91 is engineer upon this work, and Mr. Allen Hazen is acting in the capacity of consulting engineer. The city is about to build a large sand filtration plant for purifying the water supply.—We are glad to note that George H. May, formerly chief chemist and manager of the New York Leather and Paint Company, is now president of that company.—LeRoy K. Sherman, Course I., has entered the employ of Ralph Modjeski, civil engineer, of Chicago.—Herbert R. Moody, who has recently been taking post-grad-

uate work in chemistry at Columbia University, has a new handle to his name, being professor of chemistry at Hobart College, Geneva, N.Y.—Andrew R. Robertson, formerly “with” Messrs. Watson, Laidlaw & Co., of Glasgow, Scotland, is now “of” that firm.—Thomas C. Wells has left the American Bell Telephone Company to become assistant electrical engineer of the New England Telegraph and Telephone Company.—Edward C. Wells, formerly of the firm of Wells & Adams, is secretary and treasurer of the Quincy (Ill.) Engine Works.—The decennial of the class is rapidly approaching, and a well-attended reunion some time during the year is hoped for. The secretary will shortly send out notices asking for individual expression of opinion as to the most desirable time for holding this meeting, whether at the 1902 Commencement or in the 1902 Christmas recess.

1893.

FREDERIC H. FAY, *Sec.*

60 City Hall, Boston, Mass.

Walker Memorial Gymnasium:
'93 has been passed in the size

of its subscription by the class of '87, whose subscription exceeds ours by a few hundred dollars. Although the amount of \$100,000 originally asked for by the committee has been subscribed, yet, as the gymnasium is to cost perhaps double that sum, it may readily be understood that additional subscriptions will still be warmly received, and it is the hope of the writer that enough such will come from our class to bring us again to our former leading position. In connection with this gymnasium matter the following letter from an Armenian graduate will be read with interest, not alone because of the intense loyalty shown for the Institute, but also for the insight it gives into the wide field now covered by Technology men:—

“CAZVIN, PERSIA, March 8, 1901.

“*My dear* ——,—I am in receipt of your esteemed of the 21st ult., and should apologize for not having answered you up to present, as I thought I had already written you long ago. I have to thank you greatly for the trouble you had taken in sending me the catalogues for

arms, watches, etc. Enclosed you shall find a 'Walker Memorial' blank. As you notice, I have subscribed for '93. I have subscribed an equal amount also for '94. It is very inconvenient to send money from this country to America. More than a year ago I sent to London some \$60 for books, papers, etc., and have not heard since, and, although I have got something in return, do not know how my account stands. I hope I shall be able to forward to you these subscriptions in due time. By the request of the *Engineer* (London), I wrote an article about the new Russian road from Enzeli to Teheran. It was published in its impressions of the 1st and 15th of last month. It is illustrated with fourteen photographic views, and might prove interesting reading to you. About two weeks ago I had the great honor of having an audience by his Royal Highness Salar-ed-Doulah, the fourth son of the Shah. He is a young man of about twenty-two, very fond of European ideas and culture. His first adviser and business man is a young Armenian Khan, having an *American education*. The prince wanted to see me, in order to ask

me to study the feasibility of irrigating the plain of Cazvin by means of the discharge of the Sharoot River. He also wants me to take care of his forty villages situated and scattered in the province of Kermanshah, and to modernize them. I am afraid in this particular job I cannot well succeed, as I have a very limited knowledge about horses and cows. Just now I am practically doing nothing. But within a month or so I expect to be tremendously busy. The road from Resht to Teheran has to be considerably improved; a branch road from station Piri-pazar to Monbarekabad on the shores of the bay of Enzeli has to be made; at Monbarekabad an artificial port has to be built; they talk also of a new chaussée from Tabriz to Teheran, which is an enterprise of considerable magnitude and of great political importance. In all these I hope to have a due share of participation. I have been receiving a lot of printed matter, and am glad to learn that the amount of subscription from the alumni shall reach its intended limit and the Institute shall soon be endowed with a fine department devoted to the physical culture

and well-being of the students. From my own experience during the last two years, I know how essential it is for a civil engineer to be of good health. If I had been of weaker constitution while we were working on a very unhealthy section of the road I might have fallen sick as most people did, and thus have lost, perhaps, my chance of success. But then it seems to me the character of a civil engineer, more than that of anybody else, should be shaped in view of *the reality*, *i.e.* hard labor and weighty responsibilities, which require seriousness and equilibrium. While I was in America, I noticed that most of the games and amusements, which were highly prized by all the universities and colleges, served more for *réclame* and booming rather than for the true scientific equipment of the man for the battle of life. I am sure at our Institute all these games and associations pertaining to physical and social culture shall be cast into a scientific mould and made to serve their proper end.

“T².”

A combined steel and concrete gravity dam, the first of

its kind in the world, has recently been built at Redridge, Mich., under the direction of Frederick G. Coggin, Jr. The base of the dam is of concrete, whose weight is sufficient to withstand the water pressure. Upon the base rests the steel superstructure, consisting of a series of bents or “A” frames carrying curved steel plates which form the face of the dam. The steel structure is 464 feet long, and the ends are imbedded in concrete abutments. Beyond the abutments extend masonry core walls with earth embankments, making the total length of the dam about 1,000 feet. Its maximum height is 74 feet. One other steel dam has been built, that at Ash Fork, Ariz.; but in that structure the steel-work was anchored directly to the rock in a cañon, and reliance is placed wholly upon the anchorage to resist overturning or sliding. In the Redridge dam, however, a natural rock anchorage not being available, there was used a concrete base of sufficient proportions to make the structure a gravity dam. The dam has been built to supply about 25,000,000 gal-

lons of water daily to the stamp mills of the Atlantic Mining Company and the Baltic Mining Company. Mr. Coggin, as superintendent of both mills, has had charge of the construction of the dam. Those who are interested in this matter will find a long description of the work in *Engineering News* of August 15, 1901.—William A. Tucker is probably the first '93 man to be struck by lightning. On July 17, while in a barn seeking protection from a violent thunder-shower, a bolt of lightning struck the iron rail upon which the barn door travelled, and divided, one portion striking and instantly killing two horses and the other striking Tucker. Several other persons were with him at the time; and they were blown by the concussion from one end of the barn to the other, but were not otherwise injured. Tucker's escape from death was almost miraculous, and the only serious consequences he suffered were a few burns and a temporary paralysis of one side. He was confined to his bed for a few days only. Tucker has this fall accepted the position

of instructor in mining engineering and ore-dressing in the Michigan College of Mines at Houghton, Mich., and left Boston early in September to enter upon his new duties.—Professor William Esty, M. Am. Inst. E. E., in charge of the Department of Electrical Engineering, University of Illinois, has been appointed to a professorship in electrical engineering in Lehigh University, of which Dr. Thomas M. Drown, formerly of the Institute Faculty, is president.—William W. Crosby and Herbert N. Dawes have been spending the summer together abroad. They sailed from Boston the middle of July, and were expected to return late in September.—Faustino A. Perez is now located at Parras, Mex., where he is engaged in mining. He still maintains his interest in Technology, and through his advice several young men have come from Mexico to study at the Institute.—W. T. Knowlton, for the last two or three years assistant engineer of the Honolulu Sewerage Company, engaged in building a sewer system for that city, returned to Boston last spring. The present legis-

lature of Hawaii, in its opposition to progress and reform, failed to make an appropriation for the continuance of this work. Consequently, Knowlton came home. At present he is with Hering & Fuller, consulting hydraulic engineers, at 100 William Street, New York City, and for them is investigating a proposed system of underground water supply for Meadville, Penn.—E. E. Blake and family have been spending the summer at Plum Island about three miles from Newburyport, near the mouth of the Merrimack River. He has but recently recovered from a severe attack of typhoid fever.—William T. Barnes's address is 773 Broadway, South Boston, Mass.—At a recent meeting of the Boston Society of Civil Engineers, Frederic H. Fay described some tests made by him upon the strength of fireproof floors. An account of one of these was published in the *Journal of the Association of Engineering Societies* for February, 1901, under the heading "A Test of the Strength of Rapp Floor Arches."—Philip E. Perry is with the American Bell Telephone Company, Boston; and

his address is 60 Elm Street, Jamaica Plain, Mass.—The address of Wilfred A. Clapp is Box 93, West Boylston, Mass. (Note his loyalty to the class.) Clapp is still assistant engineer in the Reservoir Department of the Metropolitan Water and Sewerage Commission, and is employed upon the construction of the immense Nashua River reservoir at Clinton, Mass.—Walter W. Patch contributed to the *Engineering News* of April 13, 1899, an article entitled "Some Observations on the Use of Polar Planimeters." He deals particularly with the sources of error and degrees of accuracy encountered in the use of this instrument, and by tables and diagrams the accuracy of the actual work of a number of instruments is compared. The article will be of value to all who use the polar planimeter.

1896.

F. E. GUPTILL, *Sec.*

1006 E. Main Street, Richmond, Va.

H. C. Hultman has just recovered from a month's illness of typhoid fever, and is again attending to business.—E. C.

Atkins was married to Miss Gertrude C. Fuller at Portland, Me., on Monday evening, October 7. They will be at home, in Providence, R.I., after December 1.—F. E. Guptill has been in and around Boston the last month, spending a vacation of combined business and pleasure.—Herman Charles Lythgoe and Miss Maude Elene Noyes were married June 12 at St. John's Episcopal Church, Winthrop. They will reside at Woodside Avenue, Winthrop, Mass.

1897.

JOHN A. COLLINS, JR., *Sec.*

55 Jackson Street, Lawrence, Mass.

The marriage is announced of Miss Sarah Stevens French, of Salisbury, Mass., to Mr. Robert Somerby Lunt, on Monday, September 9.—James W. Smith has been engaged during the summer in engine-testing in the Southern States.—Earl P. Mason, formerly with the Draper Company, Hopedale, Mass., has associated himself with gas-engine works, with headquarters in New York City.—William Otis Sawtelle spent the summer abroad, chiefly on a pleasure trip.—The annual

class reunion and dinner will be held at Young's Hotel about December 7 or 14. The event of last year was a pleasant surprise, inasmuch as we were enabled, through the courtesy of our old time rival, '98, to meet for the first time Dr. Pritchett. Let us hope that our dinner this year will be no less pleasant.—Lucius S. Tyler has returned to Boston after a year in business in Philadelphia.—“R. G. Hall, chief chemist and assayer for the American Smelting and Refining Company at the Pueblo smelter, and who has been with the company for the past four years, has resigned his position and accepted the management of the American-Nettie and the Merchants' and Gold Mining Companies, at Ouray, Col. These two mining companies are owned by St. Louis capitalists, employ about 1,000 men, and have been steady shippers of ore for the past ten years. Mr. Hall is an excellent man for the place, having a thorough knowledge of the mining business, and youth and energy to back him in his work. Mr. Hall has the respect and esteem of every smelting man in Pueblo, and has a wide

circle of friends and acquaintances, all of whom will regret to know that he is going to leave Pueblo, but will be pleased to learn of his advancement to such an important and responsible position. Mr. Hall will leave Pueblo in a few days, accompanied by Mrs. Hall, for their new home in Ouray. Not only will Mr. Hall be missed from Pueblo business circles, but Mrs. Hall will be greatly missed from the social circles of the city." (Pueblo, Col., *Daily Chieftain*, July 23, 1901.) — John A. Collins, Jr., secretary of the class, was married on October 16 to Miss Mabel C. Fisher, of Newtonville. Kimberley and James W. Smith, '97, and Watrous, '99, were among the ushers.—The marriage is announced of William Wise Eaton and Miss Florence Ester, of Wissahickon, Pa., on October 16.

1898.

C.-E. A. WINSLOW, *Sec.*

Hotel Oxford, Boston, Mass.

The '98 Class Directory, which has just been printed, makes possible for the first time a general survey of the field

of usefulness occupied by the class. The wideness of this field, in the first place, is most striking. Besides a large majority still devoted to strictly technical pursuits, a good number of men have gone into commercial life, and some into teaching; while medicine, the law, the army, and the press, art and agriculture, are all represented. In many cases where the addresses of members of the class are known, no information as to occupation has been furnished. The following rough classification, however, based on the returns which are available, may have some interest. The practice of mechanical engineering, including various positions, from draughtsman to superintendent, claims the largest number of men, fifty-six, as follows: Ames, Barker, Bergstrom, Belcher, Bodwell, Bragg, Brewster, Butterworth, Coburn, Danforth, A. L. Davis, A. T. Davis, Davison, I. B. Dodge, Driscoll, Fenner, Field, Fiske, Gallison, Gladding, Haskell, Hewins, Hiller, Hopkins, Kaufman, C. E. Lord, McConnell, Miller, Mills, Minnig, Muhlig, Neidich, Newbury, Nickerson, Norton, Pease, Peavey, Perley,

Perry, Philbrick, Priest, Rutherford, Shedd, Sullivan, Swift, M. E. Taylor, Tew, J. D. Underwood, Walpole, Warren, Weimer, Wesson, C. W. Wilder, R. E. Wilder, C. F. Wing, Zimmermann. The next largest contingent includes those who occupy business positions outside of technical work. It numbers forty-six men, as follows: Alland, Barrett, Bennett, Boardman, Boeck, Bryan, Campbell, Clifford, H. F. Cobb, E. F. Currier, Fleming, Fownes, Harahan, Hastings, Hawes, G. W. Hill, H. A. Hill, Horsey, Humphrey, F. H. Jones, Kellogg, Koch, Lippincott, Long, H. I. Lord, Marshall, Mayer, Morgan, Osgood, Paige, Palmer, Peckham, J. T. Robinson, W. A. Robinson, Russ, A. Sargent, Scott, Small, C. H. Smith, G. Smith, Stickney, Treat, Twombly, Whitmore, D. L. Wing, Woelfel. The third place is occupied by forty civil engineers: E. F. Ayres, Byam, Fearing, Horton, Huntington, and Wadsworth (all with the N. Y. C. & H. R.R.), and Bacon, Benson, Chace, Hinckley, F. A. Jones, Lacy, S. M. Milliken, Skinner, Steffens, and Van Horne are all in railroad

work; Butcher, French, Goldsmith, Hubbard, Pratt, W. A. Smith, Snelling, and Wood are in sanitary engineering; and E. Johnson, Larrabee, Sickman, Ritchie (all in the government service), Blossom, Bray, Dater, Drake, Frye, Lane, Learned, Moebis, Monteith, Sawtelle, Sherman, and Walker are working in other lines. Thirty-seven of the class are in the electrical business: Arnold, M. V. Ayres, C. D. Brown, Cutter, Faught, P. H. Lombard, Wessel, W. A. Wilder (all with the General Electric Company), Alexander, Bleecker, Cornell, Shaw (all with Stone and Webster, Boston), Bergen, H. L. Cobb, Craven, Crowell, Dawes, Dodd, Fleisher, Innis, Howard, P. F. Johnson, King, Lansingh, McJunkin, Morrill, Morris, Newhall, Pen Dell, E. B. Richardson, A. E. Sargent, H. E. Sargent, Staples, Streng, Tappan, F. S. Tucker, Waterson. Thirty-three are architects: J. R. Allen, Bennink, Burnham, Conklin, Cotter, Miss Crane, Dana, De Golyer, Ferguson, Foulkes, Furbish, Heathman, B. H. Johnson, Keene, J. F. Kelly, F. M. Kendall, Lee, Little, MacFarlane, McIntyre,

Mathews, Putnam, Richmond, Russell, G. L. Smith, G. P. Stevens, Stillings, Tallmadge, Tietig, A. H. Tucker, Ward, and Whitten. Twenty-nine are chemists, including Bancroft, E. R. Barker, Boyle, D. Q. Brown, Butler, Chapin, Cottle, J. B. Dixon, Edgerly, Fisher, Franklin, Goddard, Godey, F. L. Hayden, Hooker, Jacoby, W. Kelley, R. E. Kendall, Kutroff, Leonard, Mommers, Porter, Sears, Seidensticker, H. T. Smith, Southworth, Ulmer, Watkins, and White. These six classes are by far the largest. Then, after a considerable gap, follows a group of fourteen teachers: B. A. Adams, Bishop, Miss Cade, Miss Forrest, Higgins, E. F. Kimball, Miss Langford, Nelson, J. H. A. Smith, Sturtevant, Miss Thomson, Miss Usher, Riley, and Winslow (the last two at the Institute). Thirteen of the class are mining: Blackmer, Colcord, Draper, Earle C. Emery, Gilbert, L. A. Hayden, Hitchcock, Hutchinson, LeMoyne, Shook, A. W. Tucker, Watrous, and Wiard. Seven are engaged in ship-building: Booth, H. L. Currier, Goddard, W. E. Kimball, Packard,

Page, and Wallace. Seven are pursuing advanced studies: Cox, House, Ingalls, Blanchard, and Thompson in Europe, and Coffin and Scudder in this country. Lambert is practising, and H. W. Jones, S. F. Jones, F. L. Richardson, Robertson, and Snow are studying, medicine. Allyn, Curtis, and Portner are practising law; and Leiper is preparing to do so. Babson, Blood, and Caspary are stock brokers, Daly and Murlless dentists, and G. W. Adams and Cleaveland Christian Scientists. Pillsbury is a lieutenant in the army, Camp a paymaster in the navy. Gardner is on the *New York Mail and Express*, Doty in a bank, Miss Buck in library work, High is stock raising, Willis is managing a rubber plantation, and Denison is an artist.—Russ announces his engagement to Miss Marion Sherman, of Quincy.—Wadsworth has been again promoted, and transferred from New York to Albany.—Thompson and Winslow have been appointed instructors at the Institute. The former is spending this winter in study abroad.—Snelling has a position with A. D. Fuller, '95, who has just opened

an office in Boston as a consulting and contracting engineer.—Torrey has given up his Philadelphia office, and has been in Boston during the summer.—Seidensticker has been spending his vacation at Hull, and will return to Cuba in the fall.—Steffens resigned from the Bridge Department of the N.Y., N.H. & H. R.R. in April last, to accept a position with the Erie R.R. as engineer in charge of the elimination of grade crossings at Middletown, N.Y. From there he went to Hornellsville, N.Y., to take charge of the construction of a large coaling station. This, at the present time, is the most responsible piece of work being built on the road, and involves the construction of enormous trestle-work with pockets for coal for locomotives and conveying machinery, an up-to-date ash-pit, a large storage pocket, a sand-house for drying and storing sand, and machinery for elevating and storing the same. The total cost will be about \$100,000. When this is completed, Steffens will go to Rockville Park, N.J., to superintend the construction of a mammoth storage plant for coal,

which will have a capacity of half a million tons of coal, and is estimated to cost as many dollars.

1899.

WALTER O. ADAMS, *Sec.*

1776 Massachusetts Avenue, No.
Cambridge, Mass.

James A. Patch, ex-Course X., who is now instructor in science at the Syrian Protestant College in Beirût, Syria, writes in part as follows: "The country is delightful, and there are so many foreigners (English, German, and American) that it hardly seems like being out of civilization. We *are* civilized here in our city of about 150,000, with gas lights, fine water-works, some sewerage, good roads, etc. We have no electricity, as the old chap who rules the place is afraid that any dynamos might be used to make dynamite with which to blow up his kingdom. We have a fine American community, and hardly a week passes without a call from some American tourist. I reached the college at a period of expansion. . . . The new science hall is going up; and I am to suggest the arrangement of two of the lecture-rooms, physics

and chemistry. Our recreations here are tennis, swimming, and horseback riding on the real Arab steed." — Amasa A. Holden writes telling of the birth of a son, Edward Fuller Holden, on August 29. Young Edward is the second boy born to a member of '99, the first and class boy being the son of W. T. Cannon. — The engagement is announced of Burt R. Rickards, ex-Course V., to Miss Alma Leighton, daughter of Mr. Samuel P. Leighton, of Melrose. — George H. Priest, ex-Course X., was married on September 5 at Hopedale, Mass., to Miss Maud A. Woodbury. — A letter somewhat different from the one published above, but none the less interesting, has been received from a classmate. He says: "My position is simply this: I do not see in what way I can benefit either myself or anybody else by continuing to be a member of the class organization and paying my annual dollar, so long as I live so far away from headquarters as I am at present. If I were in Boston or vicinity, I would gladly pay the dues and derive what pleasure I could from it in the way of dinners, etc.; but under present circumstances

I do not see how I get any benefit from it. So I present my resignation." . . . The officers of this class regret that they are unable to furnish the equivalent of one dollar in the way of entertaining the members of the class. It is, however, in a degree encouraging to them to note that at least a few, say roughly some 90 per cent. of the men of '99, are willing, for the sake of Tech, in the gratitude they feel to her for their start in life and for the aid that the co-operation of all the alumni will give alumni that are to be, to forego the pleasure that "I" can get with a whole dollar, and to help with that mite, which, when joined with all the other mites, makes active graduate class work possible and successful. — The marriage of Frederick W. Grover to Miss Bessie W. Tibbetts at Victor, N.Y., is announced. — H. G. Johnson is now with the Boston Woven Hose and Belting Company as head of their testing department. — The class dinner and annual meeting will be held in December at Boston. A detailed announcement will be made in due season. There will be no monthly suppers or meetings.

1900.

GEORGE E. RUSSELL, *Sec.*

Lincoln Trust Building, St. Louis, Mo.

A scarcity of class news seems due to the fact that since last May the absence of the secretary from Boston has cut him off from the gossip of Technology Club meetings, which, late in the spring, grew quite numerous. A few pleasant letters have come from members in different States, all ringing with enthusiasm and hinting at splendid prospects. With the approach of the fall and winter months, one cannot but think of reunions; and, although the class reunion does not come till late in the spring, arrangements will be made to bring near-by members to the Technology Club once a month for social purposes. As the end of another school year will bring with it the event of our first class publication, it is not too early to remind all that, to secure representation in it, they should communicate their positions, etc., to the secretary. To this end there will be sent circulars to the members, as was done last year; and an early reply will greatly help matters.—Emil F. Vogel writes from Co-

lumbus, Ohio, where he still retains his connections as designer with the Case Manufacturing Company.—Since our last issue James W. Hussey has accepted a position with the Scientific Department, New York Shipbuilding Company. Course XIII. seems to be giving a good account of itself.—Herbert R. Stearns is making notable progress in his investigations carried on for the Metropolitan Sewer Commission. He took a two weeks' trip through Buffalo, Niagara, the Thousand Islands, and Montreal this summer.—Charles H. Stratton went to Annapolis the first of the summer to assume the position of inspector on the new Naval Academy building. The project is an immense one, involving some ten millions of dollars. With him is Philip Benson Cooper.—Russell Suter has gone to Jersey City with the Continental Filter Company.—Paul Leon Price sends a letter from East Berlin, Conn., where he is in the employ of the American Bridge Company.—Walter A. Moulton is representing Perrin, Seamans & Co. of Boston, who carry a line of construction tools and contractors' supplies.

—George E. Russell, who has been with the American Car Foundry Company at Detroit since last May, goes to St. Louis as chief engineer with the Western Office of the Steel Car Department.—Clinton D. Thurber has left the Pennsylvania Steel Company, and successfully passed examinations for a position as engineer with the Navy Department at Philadelphia. He has received appointment, and has been in his new position several weeks.—Brownell has gone to the Pennsylvania Steel Company to do some yard construction work for them. With him went Eben L. Chapman.—On Wednesday evening, June 12, at Brighton, Mass., Miss Beulah Dunklee and Edward Everett Bugbee were married.—John Frank Wentworth and Miss Elizabeth Delia Powers were married at Rochester, N.H., August 5. They will be at home in Washington, D.C.—On Thursday evening, July 18, George E. Russell, of Woburn, and Miss May E. Emerson, of Winchester, Mass., were married in Detroit, Mich. At home after October 1 in St. Louis, Mo.—The marriage of Harry M. Thayer and Miss Annie Louise

Alden occurred at Brockton, Mass., on August 27.—And still another son of 1900 has gone into the ranks of the Benedicts. On June 19 Francis Lincoln and Miss Appleton were united in matrimony. The secretary regrets absence of further information as to place. Lincoln has accepted a professorship in a New Mexico university. Surely, our class is growing in greatness every day with its new acquisitions and honors.

1901.

ALBERT W. HIGGINS, *Sec.*

Saylesville, R.I.

As there has been no meeting of the Executive Committee of the class, no definite plans for the coming year have been made. It is hoped, however, that we will be able to have two reunions, to be conducted informally and at moderate cost. If possible a Bohemian lunch will be served, one evening a month, at the Technology Club, where all '01 men can get together and have a good time talking over their new work. As yet, so few blanks have been returned, nothing definite can be said in regard to the Class Cata-

logue. It will expedite matters greatly if these blanks are filled and returned to the secretary at once. The total amount subscribed by the class for the Walker Memorial is now \$5,155. There are still quite a few who have as yet given nothing. Those who have not subscribed can obtain subscription blanks by applying to the secretary.—W. C. Appleton is with Peabody & Stearns, architects, Boston.—Francis K. Baxter is assistant superintendent of the Wilkes Mining Company, Grantville, Ga.—During the summer season “Matt” Brush has been purser of the “Miami,” running between Mackinaw and Duluth.—A. H. Birks expects to return to the Institute. This summer he has been with the Eastern Bridge Company of Worcester, Mass.—H. T. Blanchard is with Shepley, Rutan & Coolidge, architects, Boston.—The *late* Fred-
eric Roy Courtenay Boyd is doing “special investigation in the development of condensers” for the General Electric Company, Lynn, Mass.—L. S. Butler expects to spend a year in Paris, studying architecture.—C. W. Cade is with the Blake

Manufacturing Company, Cambridge.—A. B. Campau is going abroad to study architecture.—A. A. Cassani, G. E. Gustafson, and A. B. McDaniel are with the American Bridge Company, East Berlin, Conn.—F. A. Colby is with Shepley, Rutan & Coolidge, architects, Boston.—F. W. Coburn and O. H. Perry, Jr., thought a trip abroad would be beneficial before beginning work this fall.—F. W. Claffin is with the engineering corps of the B. & A. R.R. At present he is engaged in work at Chester, Mass.—W. M. Curtis is with the Crosby Manufacturing Company, Boston.—F. C. Cross is salesman for the Henneman Coffee Roaster Company, Fitchburg, Mass.—H. E. Dart is to be assistant in electrical testing at the Institute.—W. F. Davidson is draughtsman for the National Steel Company, New Castle, Pa.—E. P. Fleming is surveyor and assayer for the Troy Copper Company, Globe, Ariz.—F. W. Freeman announced his engagement to Miss Lucia M. Proctor, of Newtonville, Mass., Class Day.—L. R. Henrich and N. G. Holford expect to return to the Institute for advanced work.—

This summer V. F. Holmes has been chemist for the New Jersey Zinc Company, Palmer-ton, Pa. He will return to the Institute in the fall.—S. Hazle-wood has been assisting the city engineer of Lynn this summer.—A. W. Higgins is draughts- man for the Sayles Bleacheries, Saylesville, R.I.—A. T. Hyde, after returning from a trip through England, accepted the position of chemist with Stone & Webster, and is now at Rumford Falls, Me.—K. H. Knox expects to travel in Asia and Europe the coming year.—H. C. Marcus is travelling through the Western States as mining expert. When last heard from, he was in Ely, Col.—C. E. Martin is with the Metropolitan Water Board.—H. P. McDonald, Jr., is draughtsman for the Smead & Co. Iron Works, Jersey City.—S. B. Miller is surveyor and draughtsman for the Asso- ciated Factory Mutual Insurance Company, Boston.—P. W. Moore, P. A. Potter, and "Ed" Seaver are with the Pennsylvania Steel Company, Steelton, Pa.—

D. L. Ordway is assistant chem- ist for the International Paper Company, Glens Falls, N. Y.—F. W. Puckey is architectural draughtsman for Welch, Smith, & Provot, New York, but expects to return for post-gradu- ate work at the Institute.—J. R. Putnam is draughtsman for the American Soda Fountain Company, Boston.—T. F. E. Reardon is with the engineering department of the Central Dis- trict and Printing Telegraph Company, Pittsburg, Pa.—R. C. Robinson and A. C. Davis have been assisting Dr. Mulliken.—A. W. Rowe will be in Provi- dence this winter.—R. H. Stearns is rodman for the Met- ropolitan Sewerage Works.—C. G. Tufts is Dr. Gill's pri- vate assistant.—R. W. Wight is draughtsman for George Law- ley & Sons, South Boston.—R. L. Williams has been con- nected with the White Moun- tain House.—S. L. Wonson has been travelling in Utah and Arizona.—W. W. Walcott has entered the Harvard Medi- cal School.

NECROLOGY

DENNIS E. CALLAHAN entered the Massachusetts Institute of Technology in September, 1889, with the class of '93. He early showed himself an apt scholar, with a special proficiency in mathematics, and stood among the best mathematicians in the class at the time of his graduation from the Electrical Engineering Course in June, 1893.

The following year he entered the service of the city of Boston as electrical engineer in the Wire Department. His ability early attracted the attention of those with whom he was associated in this department; and his excellent work received merited recognition when, in 1896, he received the appointment of assistant superintendent of the Water Department, having charge of the extension of the water system of the city of Boston. This position he filled with credit and ability up to the time of his death, which occurred November 28, 1900, at the age of twenty-nine years. His death was due to rheumatism, contracted during the performance of his duties, which frequently made it necessary for him to be exposed in all kinds of weather.

JOHN CLIFFORD BROWN was born March 28, 1872, at Portland, Me., and died in Los Angeles, January 16, 1901. His early education was obtained in the public schools of Portland, and in them he prepared for the Massachusetts Institute of Technology, which he entered in 1889. As to his life and work while at the Institute, the following lines from one who knew him well at that time give a very vivid impression:—

“John Clifford Brown was one of the youngest and brightest men in '93. He was, perhaps, slightly too boyish in appearance to impress those who did not know him well with the full maturity of his mind, and too uncompromising to be what is called popular. These things, no doubt, kept him from holding many class offices, without lessening, however, his interest in class affairs, regarding

which he was not only always willing, but also able to give valuable advice.

"As a student, his work was well above the average. He was intellectually very capable, indeed, though the formal record of his work may not show this; for he was full of the animal spirits of youth, and could not always resist the proffered frolic. Indeed, these same animal boyish spirits and the sincere love of companionship were his worst enemies, and forced him unconsciously to undertake, in addition to his studies, more than his physique was intended to stand. As a student outside of Tech, he devoted considerable time to history and military affairs, and was able to talk very interestingly on such matters relating to this country, although he was not often willing to do so. Ornithology, also, seemed particularly to attract his attention.

"During his Freshman year he roomed on Charles Street, and for the remaining three years on or near St. James Avenue. His room was always open to friends or strangers, and his hospitality never failed. As intimated previously, he never held an office of prominence in the student body, though he was class auditor for three years, and a member of many committees.

"Socially, 'Jack' Brown was kind-hearted, sympathetic, and true, though independent. He had the natural ability to command respect and devotion wherever he chose. He was quick to discover and admire real ability in others, wherever found; and the friends he made during his four years at the Institute were from all walks of life. He was a member of the Theta Xi Fraternity, K₂ S., Sophomore Society, Hammer and Tongs Club, and the Electrical Engineering Society. He was American to the core, and martial in spirit; and it was not a surprise to those who knew him best to learn that his death occurred while serving his country in the army in time of need."

Upon leaving the Institute, he entered the employ of the Metropolitan Telephone Company of New York, serving in various capacities until he was promoted to the position of assistant engineer. He was always interested in military affairs, and soon after reaching New York joined the Seventh Regiment, and was advanced to the grade of captain.

On the breaking out of the Spanish War, he was made captain of Company C, Eighth Regiment, of the New York Volunteer Infantry. With his regiment he went to Chickamauga, and remained there until his regiment was mustered out in November, 1898. On January 22, 1899, he was commissioned first lieutenant of Company F, Two Hundred and Third New York Volunteer Infantry, and was mustered out March 25, 1899.

On June 22, 1899, he enlisted as a private in Company B, United States Engineer Corps, and was at once ordered to Manila, where he arrived August 13, 1899, having sailed there on the transport "City of Vaza." He was at once ordered to the north of Luzon, where he saw a great deal of active fighting. His work was highly commended by his superior officers, especially that of plotting and mapping in the northern part of the island of Luzon. While in active service, he was promoted to the rank of corporal.

He returned to Manila somewhat weakened from the exposures and rigors of his active campaign, was taken sick with dysentery, and ordered to the hospital at Manila, where he remained until ordered home, November, 1900. On his homeward voyage, although very weak, he would not give up; and by the exercise of his great will power he went through the voyage without allowing himself to be taken into the hospital. He repeatedly stated that, as soon as he reached this country, and could once more see his mother and the other members of his family, he would get well. One of his brothers was spending the winter with his wife in California, and they met him upon his arrival in San Francisco, and, seeing at once his weak condition, telegraphed immediately for his mother. When Mrs. Brown reached California, she said she would never have recognized her son. He weighed less than ninety pounds, and was so wasted as to remind his mother of the Indian famine sufferers. About a week after her arrival at San Francisco, Mrs. Brown was taken ill with pneumonia, and died after a few days' sickness; and in a few days after her death his grandmother also died in Portland. "Jack" had begun to improve somewhat, but his mother's death had a very bad effect upon him. As soon as he was able, his brother went with him to Southern California. The

first reports after his arrival there were quite encouraging, but the fatal disease had so weakened him that it was soon seen that there was no hope for him, and upon January 16 he died in Los Angeles.

His funeral took place in Portland upon January 26. He was buried with military honors, with pall-bearers selected from among the soldiers of the regular army at Fort Preble; and a corporal's guard escorted the remains to the family lot. At the grave a corporal's salute was fired.

He was a member of the Racquet and Tennis Club and University Club of New York and the Cumberland Club of Portland, in all of which he was a popular and prominent member.

While in the Philippines, he kept a voluminous diary; and this, together with many letters which he wrote home, has been printed for private circulation among the immediate friends, and is said to be most interesting.

JOHN GOULD ANTHONY, whose death recently occurred, was born in Cincinnati, Sept. 1, 1871. As a boy, he attended the public schools of that city, and remained therein until he had completed the three years' course at the high school. In September, 1889, he entered the Institute as a member of the class of '93, and was graduated with that class in the course of Mining Engineering. In the summer following his graduation he attended the Summer School in Mining Engineering at Chicago, and thence went to Buckingham, Can., where he was engaged for three months in testing graphite. Upon the completion of this work he took up his residence in Philadelphia, where he spent two years as an assayer.

In March, 1896, he left Philadelphia, and took a position as assayer and assistant chemist for the Boston & Montana Copper Company at Great Falls, Mont., and remained in this position until August, 1899, when he went to Prescott, Ariz., as chemist for the Val Verde Copper Company, and stayed there until August, 1900, leaving to accept a position at Eureka, Col. He had been there but a short time when he was sent to Silverton, Col., as assayer for the Kendrick & Gelder Smelting Company. Soon

after his arrival at Silverton, he was stricken with typhoid fever, and died upon the 19th of January, in his twenty-ninth year.

Always studious and diligent while at the Institute, he went into the world of business with a strong determination to continue his studies and to round out more fully the education he had already acquired. True to this purpose, he purchased the latest and best professional books, and in every way strove to perfect himself. Of modest and refined tastes, he sought only the best associations; and in the small mining towns to which his work called him he was always a welcomed guest at the best homes and, whenever possible, an ardent worker in the church.

In his death the class of '93 has parted with a loyal member, one who during his college career was always at the class meetings, and, although never actively connected with the administration of class affairs, was, nevertheless, greatly interested in whatever was before the class for consideration; and his influence was ever exerted for the welfare of the organization.

The following spontaneous tribute from one who was well acquainted with him shows very clearly the kind of man he was: —

“IN MEMORY OF JOHN GOULD ANTHONY

“The untimely death of Anthony was a shock and grief to those who knew him well, and it is a pleasure and duty to bear testimony of his genial, manly nature. I knew him in Philadelphia during 1894 and 1895. We were both exiles from home, and my happy acquaintance with him was one of those for which we have so often to thank the dear old Institute. It was at that period in life when dreams of conquering the world of business are rudely dispelled, and the best energies and qualities of men are exerted to the utmost to learn things and gain a foothold. Many good and true men are bitter and sceptical during this period, but it must be recorded of this classmate of ours that never did his courage falter or his sunny nature lose one ray of its faith and helpfulness to others. He was active and useful in his church circle, a constant thinker on subjects concerned with the promotion of good citizenship, and a devoted lover of his Alma Mater. In this latter con-

nection it should be mentioned that he tried, at one time, to secure space in some of the Philadelphia newspapers for Technology news in order to advertise the Institute. He wrote a long description of his journey West in 1896, which was circulated among his friends. It was unusually complete and interesting, and as such displayed considerable literary merit.

“While we stand here, with all courage and willingness to endure the trials and sorrows that are our inheritance, may we not say that he is happy in being spared them, and that our lives have been better by having known this true-hearted gentleman and friend ?

J. A. E., '93.”

REVIEWS

WATER POWER: AN OUTLINE OF THE DEVELOPMENT AND APPLICATION OF THE ENERGY OF FLOWING WATER

By JOSEPH P. FRIZELL. New York: John Wiley & Sons, 1901.
pp. v, 563. 233 figures.

During the past fifteen years the employment of water power has received a wonderful impetus from the development of electrical transmission of power and from the rapid introduction of electric lighting wherever power could be cheaply obtained. Almost every New England manufacturing village has a system of lighting, operated from the falls which during the day run its mills; on the larger streams, such as the Merrimack, are extensive plants entirely devoted to the production of electrical energy; while at Niagara are the culminating works, which excite the wonder and admiration of thousands who visit the Exposition.

A treatment of the combined works going to make up a water-power plant has hitherto been lacking, and in taking up the subject Mr. Frizell has performed a useful service to manufacturers and engineers. Having received a training in early life in that practical school for hydraulic engineers, the Locks and Canals Company's office at Lowell, to which have been added many years of professional experience, he has become well equipped to discuss the numerous problems that are involved, and to bring to the reader's attention many considerations not often presented in print.

Nearly one-half the book is devoted to dams, of which all prominent types and sundry individual examples are described, the high masonry dam being mathematically treated. Works appurtenant to the conducting of water to the turbines — canals, racks, head-gates, waste weirs, penstocks, etc. — are next considered, and the essential features of good construction pointed out. Turbines of the American type are somewhat fully described, with a partial outline of methods used for speed regulation.

Considerable space is devoted to the various modes of power

transmission; and the method originated by the author for the direct hydraulic compression of air, now being practically applied on the Quinebaug River, is clearly explained. The closing discussions on the value of reservoir storage and of pondage should be of especial interest to manufacturers; and, in view of the many suits arising over the diversion of streams for public uses, the chapter on the computation of resulting damages has importance for all who may be involved in such controversies.

DWIGHT PORTER.

ELECTRIC LIGHTING

BY FRANCIS B. CROCKER. Vol. II.: Distributing Systems and Lamps. pp. vi +, 505. Van Nostrand. Price \$3.00.

We are accustomed to expect an admirable treatment of any matter to which Professor Crocker lends his pen, and this second volume of his treatise on "Electric Lighting" is in no sense a disappointment. The present work strikes us as a distinct advance over the first volume, both in the matter and the manner of its presentation. The first six chapters are devoted to direct current distribution; and it is pleasant to observe that in the calculations of mains, in the chapter devoted to "Parallel Systems of Electrical Distribution," something more than the mere statement of results is given. There is in much of the matter published for so-called engineers of to-day too great solicitude lest their mental digestion be upset by a mathematical symbol. Then follow five chapters on alternating currents, both single and multi-phase, two chapters on overhead and underground conductors, a chapter each devoted to the arc, arc lamps, interior wiring, incandescent lamps, a brief word on lamps not employing carbon, and a chapter devoted to a description of electric meters. In two appendices are given the "National Electric Code" and the "Report of the Committee on Standardization,"—an extremely good feature. The book would be improved by something more on compensators, and by a complete index. It is, however, a most useful addition to electrical literature for the student, the engineer, and particularly for the teacher. In a word, it is admirable.

H. E. C.

INDUCTION COILS AND COIL-MAKING

By H. S. NORRIE. Spon & Chamberlain. pp. xii, 270. 79 illustrations, 5x6 1/2 inches. Cloth, \$1.00.

If this were only a more expensive book, to which greater space were allotted for review, it would be really worth while to dilate upon its picturesque, entertaining, often amusing style. The statements of scientific fact frequently, like Kipling, leave something to the imagination; and yet for the discriminating reader there is much of genuine value. No one after reading this book needs fail in making an induction coil that will spark. H. E. C.

SELF-EXAMINATIONS FOR MEDICAL STUDENTS

P. Blakiston's Son & Co. Price 10 cents.

Self-examination is good for any one, even for medical students. There seems no valid reason why a person who can answer the 3,500 questions of this little book should fail in at least securing a low pass. Most of them are satisfactorily answered in works published by P. Blakiston's Son & Co. The price of the book brings it within the means even of college professors. H. E. C.

SOUNDING THE OCEAN OF AIR

By A. LAWRENCE ROTCH, S.B., A.M. New York and London: Society for Promoting Christian Knowledge, 1900. pp. 184. Price \$1.00.

Among the bits of Class News published in another column, under the class of '84, is a note in regard to the recent work done by Mr. A. Lawrence Rotch in sounding the atmosphere by means of kites flown from a tug boat. Mr. Rotch has also flown some kites from the end of an ocean steamer on its passage across the Atlantic. He has recently published a book entitled "Sounding the Ocean of Air," which is one of the "Romance of Science" series. This book is founded upon six lectures delivered before

the Lowell Institute in Boston, December, 1898. It is devoted to chapters on Atmosphere, Clouds, Balloons, *Ballons-Sondes* for Great Altitudes, Kites, and the Results of Kite-flights at Blue Hill. The book is not only instructive, but interesting, and introduces a subject of which the public has had but little knowledge. There are illustrations, charts, and tables, showing the results of ascents of kites and balloons, and reproductions of the records made during some of the highest ascents of both kites and balloons.

THE SIGN OF THE PROPHET

By JAMES BALL NAYLOR. pp. 416. Akron, Ohio: Saalfeld Publishing Company, 1901.

A "Tale of Tecumseh and Tippecanoe," in which the hero, after many hair-breadth escapes and thrilling adventures, shared by the conventional Indian of laconic speech, the eccentric frontiersman of many and strange oaths, and the customary faithful dog, is at last united to the young woman of his choice. The story is of equal value with most of the semi-historical tales just now so much in vogue.